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ABSTRACT

This first of the two-part proceedings of an Australian Conference on Youth schooling and unemployment contains the texts of 26 research papers. Focus of the papers is on educational practices and specific problems in educational research. Topics covered in individual reports include student perceptions of specific courses; quantification in case study research; analysis of views on work and unemployment among dropouts; social background, aspirations, and educational achievement; vocational preparation and employment of phisically handicapped students in regular settings; technological change and female entry into non-traditional work areas; keeping pupils on the task; designing and implementing a meta-analysis; predictive validity of a class inventory; relationships between student characteristics, motivational and process factors, and effective career development; state response to youth unemployment; and the relationship between psychological differentiation and questioning behavior of teacher trainees. (The second part of these proceedings is available separately through ERIC--see note.) (MN)

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EVALUATION OF A NEW PHYSICAL SCIENCE COURSE: STUDENTS' PERCEPTION OF ITS RELATIVE DIFFICULTY

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Evaluation research is frequently construed as unsuitable for theory testing. Even researchers established in traditional methodology write:

> Evaluative research is not designed to support or undermine particular theoretical positions, but rather to contribute to recommendations for action. (Cooley and Lohnes, 1976, p.2).

The perceived incompatibility between theory testing and evaluative research is based on a number of readily available arguments. For instance, there is the traditional research perspective that theory testing must be conducted primarily within a classical experimental design framework, specifically involving the random assignment of units. Such conditions are rarely available in an evaluation study. In addition, theory testing is associated with what might be termed pure research in which the practical issues are not of major importance. Most evaluation studies, on the other hand, are perceived as essentially practical exercises which are carried out for particular sponsoring bodies with clearly specified limits on time and other resources. (Straton, 1977, p.2). There is a certain amount of pressure to regard the needs of various audiences of the evaluation (in particular the sponsor) as paramount. Thus in the regular day-to-day operation of an evaluation, theory testing tends to become secondary in importance.

However, when a new program or course of study is introduced into an otherwise relatively stable school subject framework, it provides an evaluation context which is particularly suitable for studying hypothesised relationships among variables. Although the classical comparison-contrast evidence available from an experimental design is not present, the introduction of a new element into the relatively stable, if dynamic, situation is an important characteristic of an experiment. This new element may so destablise the *status quo* that interrelationships among variables become magnified and more readily examinable.

This paper illustrates the manner in which such an evaluation context can be used to advantage in the empirical examination of some theoretical arguments advanced in the sociology of knowledge. The next section briefly discusses the compatibility of theory testing and evaluation models, while the subsequent section deals with some particular theoretical perspectives which are open to investigation.

EVALUATION MODELS AND THEORETICAL RESEARCH

In part because theory testing is such a difficult task in education, the opportunities evaluation studies provide for it should not be missed, let alone be excluded deliberately. And despite the misgivings of some researchers in the past, it is entirely consistent with many models of evaluation to integrate, in practice, elements of theory testing. Consider, for example, the illuminative model of Parlett and Hamilton (1976). This model is one of the naturalistic approaches to evaluation, seen as contrasting with more traditional positivistic styles which test hypotheses according to pre-

determined experimental designs. Illuminative evaluators are likened to anthropologists, immersing themselves in the research milieu and pursuing issues which have been identified largely by the immediate participants. Parlett and Hamilton see any testing of hypotheses or theories as most readily accommodated in what they describe as the third stage of the evaluation process, when the evaluators typically are

> "... seeking general principles underlying the organization of the project; spotting patterns of cause and effect within its operation; and placing findings within a broader explanatory context." (Parlett and Hamilton, 1967, p.93).

However, incorporation of theory is entirely appropriate at earlier stages of an illuminative evaluation; for example, in the first stage during which issues are identified largely by observation, interview or document search, and in the second stage, when these issues are focused upon systematically. For the informed evaluator, ideas and theories of other researchers are just as much integral, legitimate, and many would say unavoidable, components of the milieu as are the perceptions of the more direct participants in the innovation. Relevant theorists can in fact be viewed as indirect participants. It must be appreciated that an informed evaluator, with an awareness of the manner in which the findings of other research may be implicated in the innovation, is not necessarily tied rigidly to attempts to "manipulate, control or eliminate situation variables" (Parlett and Hamilton, 1976, p.92).

THE THEORETICAL CASE

The theoretical case considered here arises from Young's (Young, M., 1971) contribution to sociology of knowledge, which is concerned in part with the process of selection and transmission of knowledge in schools. Young's paper has received attention elsewhere over the last decade (Hurn, 1978) and reference to his ideas is finding its way into the Australian literature (Young, R., 1980). Young makes statements regarding the relationship between the relative status of a school subject and the nature of its content, learning opportunities, assessment procedures and the student ability range. His particular emphasis is on the process by which certain school subjects come to be perceived as more worthwhile than others and to be selected and studied by certain students on the basis of these perceptions. More specifically, he claims that the dominant characteristics of high-status knowledge are assumed to be "... literacy (or an emphasis on written as opposed to oral presentation); individualism (or avoidance of group work or cooperativeness), ...; abstractness of the knowledge and its structuring and compartmentalisation independently of the knowledge of the learner; ... and ... unrelatedness ... which refers to the extent to which (it is) 'at odds' with daily life and common experience." (Young, M., 1971, p.38).

The implications of his thesis are that a course of study which includes a significant amount of content considered socially relevant, will inevitably be perceived by parents, teachers and students to be of lower status and be less difficult than courses which are seen as socially less relevant. It is this proposition regarding perceived relative status and difficulty of course content which is checked, primarily for illustrative purposes, in this paper.

THE EVALUATION OF PHYSICAL SCIENCE

The opportunity for considering this proposition arose in conjunction with the Physical Science Evaluation Project (1978-79), Physical Science being a new subject introduced into the upper secondary school (Years 11 & 12) in Western Australia in 1978. The extensive formative evaluation followed the illuminative paradigm referred to above and covered many aspects of the introduction, development and implementation of the new Physical Science curriculum. While detailed reports of the project may be found elsewhere (Boud, Dynan, Parker and Ryan, 1979 and Dynan, Parker and Ryan, 1979), this particular paper focuses on a small section of the data gathered, namely that relating to the students' perceptions of the difficulty of Physical Science.

Essentially the new subject was introduced by the Western Australian Education Department in response to what was seen as a changing pattern of skills and knowledge required by students. Firstly, it was considered no longer appropriate that all tertiary bound students who needed knowledge of the physical sciences should have to devote as much time to the area as the traditional subjects of Physics and Chemistry required. It was considered that such time requirements forced many able students to neglect other subjects in the social sciences and humanities, some of which, such as Economics, were seen to be increasing in importance. Secondly, it was considered that changes in the school population in which a greater proportion of students in any age group chose to remain at school beyond compulsory requirements, necessitated a corresponding change in the provision of the physical sciences. In particular, it was considered that the traditional Physics and Chemistry courses were too abstract and not as relevant for many of the present students, especially in relation to the increasing practical technological emphasis in the society as a whole. Hence, Physical Science was conceived as a single subject integrating content from both physics and chemistry, with an emphasis on associated technological and societal issues and providing an alternative to the two established subjects of Physics and Chemistry, neither of which could be studied concurrently with it.

Dissemination of information regarding the new subject was carried out by the Education Department by means of detailed written documents and meetings with school staff members. It was stressed that while Physical Science clearly had a different emphasis from the traditional subjects of Physics and Chemistry, it was to be considered equal in both status and difficulty to them. The high status for the subject was enhanced by its acceptance, on equal terms to Physics and Chemistry, as a Tertiary Admissions Examination subject.

THE HYPOTHESIS TESTED

The specific point of interest here is whether despite efforts intended to ensure relatively high status for a more practical and socially relevant subject such as Physical Science, its status, as predicted from Young, is seen as relatively low.

The relevant evidence collected in the Physical Science Evaluation concerned the perceptions students enrolling for the new subject had regarding its difficulty relative to certain other subjects. Specifically, the first cohort of students choosing the subject was asked early in 1978 to rate whether each of the following subjects - Mathematics I ("general" mathematics), Mathematics II and III ("specialised" mathematics) and Mathematics IV ("basic" mathematics), Physics, Chemistry, Biology and Human Biology, was much easier, easier, about equally difficult, more difficult, or much more

difficult, than Physical Science. Subsequently, the students who remained enrolled in Physical Science for two academic years, were asked to make these judgments again in late 1979. In addition, the second cohort of students who enrolled in 1979 was asked to make the same ratings early in 1979.

Three points regarding this evidence need to be made. Firstly, the evidence pertains only to the perceptions of students, and in particular, to the perceptions of those students who enrolled for the subject. In the first ratings the students did not have experience of any subjects at the Year 11 level and in their second ratings, they only had experience in some of the subjects. However, whether based on complete information or not, because they determine in part the selection of the subjects by the students, it is these perceptions which are of prime importance. Secondly, the question posed to the students concerns only the relative difficulty and not the status of the subjects. However, it can be argued, and as pointed out earlier it is consistent with Young's position, that "more relevant" (which was intended for Physical Science) necessarily implies not only "lower status", but also "less difficult" (neither of which was intended for Physical Science). Therefore, the available evidence of relative difficulty does bear on the issue of status as well. Thirdly, the original data were not collected explicitly to confirm or refute any hypothesis. The intention at the time was simply to use evidence to help place the subject in context as perceived by the students. The detailed analyses and interpretations presented here have been developed subsequent to the main evaluation.

METHOD OF ANALYSIS

The ratings of the difficulty of subjects relative to Physical Science fall readily into the framework of qualitative data with ordered response categories. A simple and elementary approach to obtaining an index of difficulty would be to score the five possible ratings from "much easier" to "much more difficult" with successive integers and then to average these scores across the students. Clearly, the larger the score, the more difficult the subject relative to Physical Science. A disadvantage with this simple approach is that differences between numbers do not have the same interpretation at different values. For example, a difference between ratings of 3 and 4 does not mean the same as a difference between 2 and 3. This is analogous to the fact that the difference between 3 and 4 successful tosses of a coin on 4 trials does not have the same interpretation as the difference between 2 and 3 successful tosses. In this analogy, and if the coin is unbiased, the probabilities of 2 and 3 successes are respectively 0.3750 and 0.2500, while that of 4 successes is only 0.0625. Therefore, in the sense of probabilities, which are more appropriate indices in the context, the difference between 2 and 3 successful outcomes is much smaller than the difference between 3 and 4.

A model for rating which gives estimates of relative difficulty on a proper additive scale, but which nevertheless uses as its basis the simple successive integer scoring, belongs to the class of Rasch models (Rasch, 1960) of which the special case of the simple logistic model for item analysis is the most well known. The model can be adapted either to a contingency table context in which rated objects in different groups are mutually exclusive, or to a psychometric context in which objects are dependent (Andrich, 1978; 1979). In the case of the ratings in relation to Physical Science, and specifically to answer the particular question posed, the analysis requires a combination

of both adaptations. For efficiency of presentation, the analyses were carried out in a contingency table framework where each subject rated was treated as a group. Fortunately, the dependencies between groups only affect the tests of fit seriously and not the parameter estimates. The fit is, of course, crucial to any interpretation of estimates, but space does not permit the full presentation. However, the data did accord with the model extremely well.

RESULTS

Tables 1, 2 and 3 summarise the results considered in this paper. Table 1 shows the initial impressions of both the first and second cohort of students attempting Physical Science. The analysis of the ratings of the two cohorts was carried out jointly by treating each subject as a group and therefore having 14 groups. The joint analysis ensured a constant metric for comparing the relevant estimates. It is apparent from Table 1 that the initial impressions of the first and second cohorts are very similar. Furthermore, and consistent with the hypothesis to be examined, the students perceive Physical Science to be substantially easier than either Physics or Chemistry. As a group they perceive Physical Science to be a little more difficult than "general" mathematics.

TABLE 1

Scaled Difficulties of Subjects Relative to Physical Science:
Initial Perceptions of
Cohort 1 (early 1978) and Cohort 2 (early 1979)

	SUBJECTS							
	B MATH	H BIOL	BIOL	G MATH	PS	CHEM	PHYS	S MATH*
1978 (N=360)	-2.6	-1.1	-0.8	-0.3	0.0	1.3	1.5	1.9
1979 (N=650)	-2.4	-1.1	-0.7	-0.3	0.0	1.2	1.4	2.1**
Scale Differences	-0.2	0.0	-0.1	0.0		0.1	0.1	-0.2

*B MATH: Basic Mathematics
H BIOL: Human Biology
BIOL : Biology
G MATH: General Mathematics
CHEM : Chemistry
PHYS : Physics
S MATH: Specialised Mathematics
PS : Physical Science

**Values in each row are constrained to sum to zero. Physical Science has this value by definition.

Table 2 shows the initial impressions of the first cohort of students who continued with the unit in relation to their impressions approximately two academic years later. The analyses of this Table, and of Table 3, were carried out in the same way as those of Table 1. Except for "general" mathematics, Table 2 shows that all other subjects have a consistently similar lower scale value on the second occasion than they do on the first occasion. That is, after two years of study the impressions of these students were revised and they considered Physical Science more difficult than originally relative to all but one other subject, including Physics and Chemistry. Thus the intention of the course developers that Physical Science not be seen as "easy" is clearly manifested.

To check whether or not this result may be an artefact of not having the dropouts from Physical Science in the results of Table 2, Table 3 shows separately the initial impressions of those who continued with the course and of the dropouts. The impressions of the two groups are very similar, but if anything, there may be a hint that the continuing students perceived "specialised" Mathematics

and perhaps Physics to be harder than Physical Science by a greater amount than the dropouts. That is, if there is a slight difference in perception, it may be that the continuing students originally thought Physical Science even easier than the dropouts. This confirms the authenticity of the change in perceptions of the continuing students shown in Table 2.

TABLE 2

Scaled Difficulties of Subjects Relative to Physical Science: Initial (early 1978) and Revised Perceptions (late 1979) of Continuing Students of Cohort 1

	SUBJECTS							
	B MATH	H BIOL	BIOL	G MATH	PS	CHEM	PHYS	S MATH
Early 1978 (N=150)	-2.8	-1.2	-0.7	-0.3	0.0	1.7	1.9	2.7
Late 1979 (N=150)	-3.3	-1.5	-1.2	-0.3	0.0	1.2	1.4	2.4
Scale Differences	0.5	0.3	0.5	0.0		0.5	0.5	0.3

TABLE 3

Scaled Difficulties of Subjects Relative to Physical Science: Initial Perceptions of Continuing Students and Dropouts from Cohort 1

	SUBJECTS							
	B MATH	H BIOL	BIOL	G MATH	PS	CHEM	PHYS	S MATH
Continuing Students (N=150)	-3.0	-1.4	-0.9	-0.5	0.0	1.6	1.8	2.5
Dropouts (N=200)	-2.9	-1.3	-1.0	-0.3	0.0	1.6	1.6	2.1
Scale Differences	-1.0	-1.0	0.1	0.2		0.0	0.2	0.4

In relation to this point regarding perceived relative difficulty and the intentions of the course developers, it is instructive to contrast the distribution of the three categories of mathematics subjects and the three physical science subjects. The three in the former category reflect the intended coverage of the ranges of difficulty in that they are symmetrically distributed. One is seen as the most difficult, another as of middle difficulty, and the third as the least difficult of subjects. In contrast, even though Physical Science is seen as easier than Physics and Chemistry, it is perceived adjacent to them and harder than the other science subjects.

DISCUSSION

By assuming that the testing of theory requires an experimental research design, and then by rejecting theory testing when such a design is not applicable, there is a danger that primarily theoretical and persuasive discourse such as Young's will not be tested empirically in any formal sense. It may thus well become part of an accepted tradition of some educators and evaluators and part of a rejected tradition of others. Moreover, by not testing empirically theories which can be tested, and tested in a way which does not necessarily preclude other requirements of evaluation, not only will excellent opportunities for theory testing be missed, but evaluation studies may fall

into the trap of prejudiced investigation evaluators are trying to avoid.

The recognition and testing of *a-priori* theory is consistent with evaluation studies in that such theory is part of the intellectual milieu of the innovation and of the evaluator. When invoked in the way suggested above, the classical empirical model of building and applying theory can hardly be avoided. The information collected should of course be capable of either supporting or refuting the theory. To the degree that the information confirms the theory, to that degree the whole theory then is potentially applicable for understanding other aspects of the innovation. Results which refute the theory and which then need to be explained, may be equally valuable for helping understand distinctive characteristics of the innovation. Either way, therefore, this extra understanding may contribute to decisions in both the short and long term. While the question which generated the data analysed in this paper was not consciously framed with any theory in mind, the particular analysis of the results, and their interpretation, was. As argued earlier, there should be no special reason why the question itself could not have been constructed from the particular theoretical position without prejudicing the evaluation.

In the case reported here, the results do confirm that the new subject is perceived consistently to be easier than its traditional counterparts and easier than intended by the curriculum developers. For students enrolling, the subject appears to have a reality independent of the official information available. Nonetheless, the explicit intention of the course developers is manifested in the revised perceptions of the first cohort of students which found the subject much more difficult than it expected.

To illustrate further that evidence generated by theory can itself be useful to the practical ends of an evaluation, some further issues arising from the above results are suggested briefly now. Firstly, considering a short term issue, it is apparent that the results may help explain the relatively large drop out rate. In simple terms, students may have dropped out because the subject is much more difficult than they anticipated. Changes in opinions and dropout rates of the second cohort of students could help check this possibility.

Secondly, considering some broader issues which arise from the theoretical perspective of sociology of knowledge, questions regarding who is more likely to take Physical Science as a function of socio-economic status when intelligence is held constant may be revealing. It may be that the choice of the subject is a function of socio-economic status as well as of potential ability in the physical sciences, and if so, would be relevant for both counselling of students and for the monitoring of further development of the subject.

Another consideration, again raised by the theoretical position, may be related to possible changes in status of Chemistry as a subject if the new chemistry course proposed by the Australian Academy of Science is adopted, since this course is to include many of the more socially and technologically relevant topics. Young's argument indicates that, because these changes are initiated by university academics who are the acknowledged official guardians of the discipline, the modified subject should not suffer in status. However, this is open to empirical investigation, and again, this perspective could add to the framework of data collection required for evaluating the impact of the new course.

Even more generally, the particular theoretical position used illustratively here may be

important for the understanding, monitoring, and decision making with respect to the more vocationally oriented courses, which, with the current concern of transition from school to work, are likely to become more common.

It is reiterated that the case of the subject Physical Science and the perspectives of sociology of knowledge are used illustratively. On the basis of the limited evidence on the topic, evidence more or less fortuitously available in the particular evaluation, it could not be otherwise. However, for those interested in the topic, it may be considered a small step in examining one aspect of sociology of knowledge, and even with the limited data available, their furtner breakdown in terms of school, sex, previous science background of students, previous experience of teachers, and so on, could contribute towards explaining the reality of the subject as socially constructed by students.

It is also stressed that the illustration and results are not a criticism of the subject, its introduction or its evaluation, nor is the partial consistency of the results with the theory an endorsement of Young's whole position. As with other theoretical positions in other situations, the position of the sociologists of knowledge in this situation simply raises interesting and relevant questions open to empirical confirmation and refutation. Answers to questions so raised can help, not only the building of theory, but also the understanding of a curriculum innovation.

SUMMARY

A case is made for the legitimacy of *a-priori* theory and hypothesis testing within the illuminative paradigm of evaluation and illustrated using data obtained from such an evaluation. The evaluation was concerned with a new subject, Physical Science, introduced into the upper secondary level in Western Australian schools. The subject, which combined content from physics and chemistry together with treatment of related technological and societal issues, was introduced in response to a changing school population. It was intended to be more practical and immediately relevant, but not necessarily easier, than its traditional counterparts. A theoretical analysis from the field of sociology of knowledge was interpreted and the hypothesis that the new subject would be perceived to be easier was generated and investigated. Despite extensive dissemination of information by the developers to the contrary, students enrolled in both the first and second years did perceive Physical Science to be easier than Physics and Chemistry. However, the available data from the first year students also showed that after two years of study, Physical Science was perceived to be much harder than originally. Further questions which emerge from the theory and which would enhance the understanding of the Physical Science and other curriculum innovations are suggested.

REFERENCES

Andrich, D. A Rating Model for Ordered Response Categories. *Psychometrika*, 43, 4, 1978, 561-573.

Andrich, D. A Model for Contingency Tables Having an Ordered Response Classification. *Biometrics*, 35, 2, 1979, 403-415.

Boud, D.J., Dynan, M.J., Parker, L.H., and Ryan, A.S. A Discussion of Issues Arising from the Physical Science Evaluation Project. *Australian Science Teachers Journal*, 25, 2, 1979.

Cooley, W., and Lohnes, P.R. *Evaluation Research in Education.* New York: John Wiley, 1976.

Dynan, M.B., Parker, L.H., and Ryan, A.S. *Physical Science Evaluation: Report No.1.* Cooperative Research Series No.3. Perth: Education Department, July 1979.

Hurn, C.J. *The Limits and Possibilities of Schooling.* Boston: Allyn and Bacon, 1978.

Parlett, M., and Hamilton, D. Evaluation as Illumination. In Tawney, D. (Ed.). *Curriculum Evaluation Today: Trends and Implications.* London: MacMillan, 1976.

Rasch, G. *Probabilistic Models for Some Intelligence and Attainment Tests.* Copenhagen: Danish Institute for Educational Research, 1960.

Straton, R. Research of the Evaluation Process : Current Status and Future Directions. *Proceedings of the A.A.R.E. Annual Conference.* Canberra, 1977.

Young, M.F.D. (Ed.). *Knowledge and Control.* London: Collier-MacMillan, 1971.

Young, R. Development of a Likert Scale to Measure Teacher Epistemology. *Australian Educational Researcher,* 7, 3, 1980.

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QUANTIFICATION IN CASE STUDY RESEARCH

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There is a demonstrable differentiation of knowledge and perspective or 'world view' among researchers in education. We can distinguish those who support an approach to research which is experimental or psychostatistical[1] from those who emphasise a style of research which is descriptive and qualitative. Within (rather perhaps than between) each of these groups, there is an increasing divergence of opinion about the nature of the research enterprise and about issues[2] involved in the study of education. One topic of debate among both groups is the issue of quantification.

What does quantification mean in educational research?

Quantification is broadly defined here as the meaning(s) ascribed to numerical symbols and/or their additive and multiplicative operations. The psycho-statistician or quantifier measures by assigning numerical symbols to concepts or properties of objects, people, events which he has isolated in the research process. These numbers may then be manipulated usually using randomized statistical procedures leading to statements which are 'true' for the sample or representative population being studied and according to various levels of chance for the total population or 'universe'.

The descriptive or case study researcher may differ in several important respects. His research is linked to a distinctive set of epistemological assumptions tacit or acknowledged and these beliefs (or axiomatic judgements) are the starting points of his research (Hamilton, 1976). He is interested in case as instance of class or population rather than as representative of class (Stenhouse, 1977; 1979a; Stake and Easley, 1978). For him, the study of samples suggests passive rather than active observation of human actions. Perceptions are experiential rather than representational. He sees wholes rather than parts or properties (Stake, 1978). His perspective is artefactual. Between the real world and its perception, he recognizes some intervention which gives rise to 'multiple realities' and interpretations. There is no one to one correspondence between things and perceptions or images of things. His search is not necessarily for regularity; the unique and ideosyncratic may be essential in understanding the object of research.

Issues related to quantification.

While quantification and related issues are discussed and debated among psycho-statistical researchers, the subject has barely been broached by qualitative researchers particularly researchers engaged in case studies. In this paper, I want to focus on the question, 'How can quantification be used in case study research?'

There are of course a number of corollary questions and issues which directly or indirectly, result from this 'differentiation of knowledge' among qualitative researchers mentioned at the beginning of this paper. The ethnographer and sociologist may begin with quite a different theoretical position compared to the discipline-free case study researcher[3] and this knowledge difference may give rise to such questions as; 'How can numerical constructs 'add' meaning to the researcher's description and understanding of his case?'; 'How does the qualitative researcher's understanding of the research act influence his purposes in using quantification?'; 'Is quantification a useful means of data reduction (a significant issue) for the case study researcher?'; 'What is the role of quantification in

establishing comparability or generalizability across cases?'

Many issues are bound inextricably to the central question posed in this paper. My intention is not to explicate the uses of quantification according to the researcher's idea underlying his research act. Within the broad set of assumptions I outlined in the previous section, I want to explore some of the ways researchers have used and may use quantification in case study research.

Meanings that are experienced through quantification: the implicit.

There are both explicit and implicit uses of quantification in educational and case study research. The explicit involves the use of number and numerical methods that are directly observable and cognate and produce the kind of knowledge Polanyi (1967) calls propositional knowledge. The implicit use may involve observation of phenomena but it produces an experiential knowledge not necessarily immediate or directly and personally communicable in terms of a series of logical propositions.[4] The idea of propositional and tacit knowledge is presented by Stake (1978):

> Propositional knowledge - the knowledge of both reason and gossip - was seen to be composed of all interpersonally shareable statements, most of which, for most people, are observations of objects and events. Tacit knowledge also dwells on objects and events, but it is knowledge gained from experience with them, experience with propositions about them, and reflection.

Both kinds of knowledge might be used in case study research. I should like to consider the implicit uses of quantification first by taking a description of a suburb in a large midwest American city, Lou Smith's (1978a) suburb of Alte.

> The community changed from a small town, almost rural, to a major suburban community with a strong commercial tax base and a citizenry of middle to upper social classes. However, the dominant or model group is upper middle class, "executive city" as some writers label it with the first private sub-divisions zoned in 1910 into one-and-a-half acre lots; much of what now exists seems to have been determined.

The description of Alte has a 'seeing and measuring' dimension (Stake, 1979). The seeing component we are told by Smith (1978b) was the recognition of the importance of historical context. The history of the school district was 'seen' first holistically and this experience was then given meaning through a language of communication which quite clearly contains implicit measures of specific attributes and characteristics of the Alte District. While the process of measurement by the researcher may be thought to begin with the perception of the district, the measures of district attributes clearly imply the presence of numerical constructs and method.

Quantification is implicit in the description of Alte changing from small town to surburban community. Some form of quantification - population number, functional size according to type and number of services - was necessary before the district could be described and classified. The notion of change through time and the age of the community would require determination by the researcher so that Alte could be placed in historical context and the change described. The statement that the community has a 'strong commercial base' can only be defined in terms of a measure of taxation; the label 'commerical' suggests a degree of ability to pay tax; the fact that the community has a *strong* commercial tax base can only mean the district ranks high as a tax payer and reinforces the notion of size. The word symbol 'strong' may be a referent which is more quantifiable than experiential; it makes meaning by measuring an amount or degree of commercialism.

These examples appear to suggest that when qualitative aspects of some phenomena are described in language which is quantitative, words like 'strong' may have two kinds of meanings. We can speak about 'strong commercial base' and derive the reality or sharable meaning from the description.

We could also suggest that the people of Alte have strong feelings about their place. 'Strong' in this sense has a metaphorical meaning. The first we *can* measure; the second we can measure only if we were to conceive of feelings as objects.

The historical meaning in the description of the Alte district is analogous to the painting of the artist. As student teachers, I and my colleagues studied art. My closest friend used to sit meditating in front of representations of the great artists, imbibing the 'habit' of art. No one ever quite understood how Duchamp's 'aesthetic echo' could be attained although we were all aware that the appreciation of art was concerned with experiences which exhibited a qualitative dimension about which we could make a judgement. We also thought that this appreciation would come through the formal academic study of the masters or by a process similar to the kind of knowledge old and venerable church going ladies have for their god.

These two kinds of knowledge acquisition seem to reflect the way we can know a painting or the way researchers can know and interpret phenomena (Petrie, 1979). During our experiences of the phenomena, some attributes or properties of the phenomena may be significant. Hence, in the painting the relative area of shapes and the amount of a particular colour may be significant; in the description of a place, the categorisation of social class, or place size by the number of functions or services it provides, amount of commercialism, all may be highly relevent in the description. All have reality meanings and all are quantifiable.

But the painting and the description have an holistic impact or experience for the researcher (and the observer). The impact of the whole phenomena is focal and particular areas may be tacit. The experience of historical place may depend on the relation one property bears to others or to the whole view. Category of class related to place size and level of commercialism are important only in relation to other historical attributes or the whole historical context of Alte. The experience of two school districts identical in population size, areal size, class structure but with variation in commercialism could provide quite different experiences and meaning for the researcher and reader observer.

Shared meanings and quantification: the explicit.

So much for making meaning with implicit uses of quantification in qualitative research. The more explicit uses of quantification are probably of more interest to the qualitative and case study researcher. I shall attempt to outline several ways meaning can be ascribed to numbers as symbols and numbers used in some additive or multiplicative method.

Approach 1: historical use.

Firstly, numbers as symbols. In Smith's account the explicit use of numerical symbol is seen in his citing of the year 1910. The symbol itself has meaning as a point in chronological time. But within the context of the description here, it is not merely a point in time. It is significant because it is an event in time and associated with a 'series of inter-related events'. It begins a period in history. The actual meaning of the numerical symbol places it on an interval scale of time. Its descriptive and contextual meaning denotes it as a symbol marking an event which is not necessarily coincidental with other events. Its use is more convenient than compelling (Carr, 1964; Barraclough, 1967).

Approach 2: penetrative use.

There is a second use of quantification as the description of properties or attributes. Smith tends to use quantification implicitly. In contrast Sanders and Stufflebeam (whose interests are primarily

in evaluation and statistics) in the same C.S.S.E. study series (1978a) describe their district in quite a different way.

> Columbus, Ohio, is a capital city. According to the Columbus Area Chamber of Commerce, the population of the standard metropolitan area (1970 census) is 1,017,847. The city of Columbus itself has a population of 539,677, of which 19% is non-white.... The Columbus Public Schools serve approximately 96,000 students in 177 school buildings, which is a drop of about 14,000 students over the last ten years. The Catholic Diocese in Columbus serves another 15,000 students. The Columbus Public Schools' budget for the school year runs about $116,000,000, of which 87.1% goes to salaries and fringe benefits.

Quantification used here has an absolute quality. The researchers demonstrate a use of census data to describe the subjects and schools that are being measured. Meaning is made by numerical description which has a real and direct reference to the objects described. Explicit use of quantification gives the description a *penetrative* quality it might not otherwise have had.

The use of official data has long been a practice in applied political science where numerical description is important for policy decisions especially at executive level. Frequently it will be necessary for the case study researcher to convey meaning in the most *efficient* form and to report in terms of the knowledge of the audience for whom the study is being undertaken; in the study of systems, numerical language probably has its place. In themselves, the numbers used by Sanders and Stufflebeam have no reference or relative value and in this sense, may be termed evidence.[5] The population figure for Columbus is neither large nor small because no reference is made to other communities. When however the reader compares the population size of Columbus to other communities whose populations are known from experience, some form of contextual generalisation may occur (McCutcheon, 1976). This form of generalisation legitimates the penetrative use of numbers in case study research.

Approach 3: connotative use.

There is a third sense in which numerical symbols may be used in qualitative research. A number, in the same way as a word, may be used to evoke a referent(s) to here and now; to create a new immediate, experiential state by tapping for the observer-reader a particular cluster of associations. The biblical number seven for those whose mindset is toward the religious or the spiritual, evokes clusters of ideas and emotions which bear a relationship to the number. Similarly, the number thirteen evokes particular clusters of associations for the materially minded. In the examples I have cited, the experiences associated with numerical symbols will vary across and within cultures. To the Jew the number seven has a directly sharable meaning because of its religious significance. In this sense quantification may have a denotative use. Among individual members of the race, there are tacit and hidden meanings or experiences not directly communicable (although recorded as events). Quantification is used explicitly but its meaning is tacit for the observer. No doubt the advocates of fiction as a means of reporting research could happily resort to this form of use of numbers.

Approach 4: indices use.

A fourth use of quantification in qualitative research involves the development of indices. The type of index referred to here might require additive and multiplicative numerical method of the kind referred to by psychometricians as descriptive statistics.[6] It might be well to remember that indices developed in response to the realization that actual numbers and precise modes of counting and averaging used with census type data - marriage, fertility.... - were inadequate for estimating pricing trends because price unit values varied with exchange rates. Indices were developed as relative reference points. The consumer price index constructed according to an established formula is an example. The index is time-specific, contrived or artefactual and is not an actual number.

Indices might be derived by the case researcher as an artefact to *describe* trends across time or across cases. Across time use of indices has some of the character of quasi-experiments (Campbell and Stanley, 1966; Cook and Campbell, 1976; Snow, 1974). Across cases, the use of an index takes on the character of a standardized quantum. Its use is not unlike number as penetrative data.

A second means of making sense of indices is where the researcher uses the numerical artefact to provide stimulus or direction for further research. The number does not necessarily indicate which direction the research enterprise should take. A researcher may count the number of library users in a school in a specified time period and may record declining usage with increased time. An index of actual to potential or saturation use for specified times may act as entry point to research and hypothesis about library use in schools (Stenhouse, 1979b). The index is used to confirm or illuminate 'foreshadowed problems' which guide the initial phase of investigation. In both cases, the researcher is not so much interested in describing his phenomena with numbers but he seeks to search for or confirm antecedent concomitants, and subsequent phenomena.

The discussion so far has confined itself to uses of quantification (numbers as symbolic language) within a distinctive set of epistemological assumptions which characterise case study and qualitative research. The 'starting point' is the assumption that educational research is pre-eminently artefactual - descriptive, complex, holistic, illustrative, allusive, metaphorical, personalistic - and natural in that it deals with objects and events.

The issue of validity and quantification.

Many qualitative researchers however, especially sociologists and ethnographers who consider themselves case study researchers attempt to describe concepts and categories using numerical constructs. This is not to mean that theoretical concepts can be defined by direct reference to observable empirical attributes or that *empirical* constructs or indicators and *theoretical* constructs can be treated as interchangeable. If this were true concepts would become "inventions, not discoveries, interpretations not descriptions." (Hamilton, 1976). The problem is one of what criteria of validity in social research.[7] Quantitative approaches use concepts as inventions, interpetations, the reduction of reality or the observable to concepts expressed in numerical symbols and equations. Qualitative approaches use ideas as description and discovery. It may be true that the relationship between the theoretical and the empirical is problematical in any approach to social research (Evans, 1979) but for the latter it is accepted not concealed. Case study research explores discrepancies and makes them the basis for discovering new interpretations and concepts; in this sense, concepts are always essentially contested (Gallie, 1964). The task is to explicate complexity not to eliminate it. Quantification used in the framework of a scientific language is paradigmatic;[8] the legitimacy of a concept can only be established or developed within the language and the 'strength' of a given theory; all ideosyncrasies are problems outside the theory or paradigm. Conventions are used to select and aggregate data, to search for underlying regularity through a preordained technology (principal components, cluster analysis...). For the qualitative and case researcher however data are selected, methodology is not prescribed (leading to one kind of explanation) but refers solely to the interests and concerns of the investigator. *"The validity of an explanation is demonstrated by the researcher, not the data."* (Hamilton, 1976).

How does the case study researcher demonstrate that it is the researcher and not the data that engineers a valid explanation? This raises the question: 'Is it possible to discover and use social

measures that obey the laws of number, namely, addition and multiplication?'

One is tempted to attack this problem by beginning with "scale problems". Measures of attitude, interest, achievement...are traditionally slotted into four categories, nominal and ordinal, together called qualitative or non-metric, and interval or ratio, together called quantitative or metric (Stevens, 1964; 1968). There has been much discussion about these categories (Siegel, 1956; Labovitz, 1970; 1972) and recently Terwilliger (1978) has suggested three broad categories which provides a basis for what I see as the most profitable line of discussion; a) classification systems (unordered categories); b) ranking systems (ordered categories); and c) metric systems (techniques which employ a specified unit of measurement, however arbitrary).[9] Again it is important to remember that many meanings can be made with numbers and the levels of measurement problem per se is not the centralissue for the case study researcher.

Discovery, description and quantification: classification systems.

Quantification may be used with a set of mutually exclusive categories (sex, blood type, job, field of study) which are unordered. MacDonald and Walker (1975) citing Becker advocated the process of cross-tabulation in case study research.

> The observer, possessing many provisional problems, concepts and indicators....wishes to know which of these are worth pursuing as major foci of his study. He does this in part by discovering if the events which prompted their development are typical and widespread, and by seeing how these events are distributed among categories of people and organisational subunits. He reaches conclusions that are essentially quantitative using them to describe the organisation he is studying."

Examples of this use of quantification in case study research are numerous. A recent case study of subject subcultures by Ball and Lacey (1978) uses a joint frequency distribution (Table 1) to differentiate schools and to *describe* the choice of subjects students felt were most like English in the problems they posed in the classroom. A chi-square statistic of 12.78 may be obtained. Typicality of choice within categories of organisational units is evident from inspection of the data. No reference need be made to total populations since only within-case description is intended. The interpretation of what these patterns of numbers or choices means still has to be made.

	Subject Choice		
	Art/ Drama	History/ Music	Language/ Classics
SCHOOL A B	13	10	2
SCHOOL C D	9	19	21

Table 1. Choice within subject sub-cultures.

The most common error of use of categorical statistics is seen in the use of chi-square. In itself it is non-scalar. It cannot be interpreted meaningfully unless reference is made to a hypothetical distribution which allows the researcher to make a statement of probability. Some *inference* is made by reference to a wider or total population. There are many such inferential statistics of association (Goodman and Kruskal, 1954) none of which may be used validly by the researcher of a case. There are correlational measures, the ϕ statistic, for example, which might be used in the search for a major foci of study; the case researcher can only use those quantitative statistics which are consistent with the notion of case as instance of class.

Futures in quantification: metric systems and sample studies.

There are 'case' researchers, notably the ethnographers and sociologists, who have a taste for the study of samples and their analytic categorization. They usually employ some aspect of statistics related to Terwilliger's ranking or metric systems. Their research is useful and valid within a set of assumptions but it does not focus on the description of cases and may not be styled case study research.

The difference between the study of samples and the study of cases bring us back to the essential

distinction between case study research and 'traditional' or experimental research; the distinction between case as instance of class and case as representative of class which is studied through some form of theoretical sampling. Both are legitimate forms of research enterprise; both may use quantification within sets of distinctive epistemological assumptions; both are complementary and necessary in educational research (Stenhouse, 1979).

There are a number of interpretations that may be given to the idea of complementarity. I want to conclude this paper by citing two examples, the first of which does not truly fall within the intended meaning; and the second which attempts to show how quantification may be used to provide a foci for study *within* a case.

The first example is of a quantifier who like the case study researcher wishes to discover the meaning in his data actively rather than determining the meaning passively by statistical logic. In a study of learning process, Chapman (1979) aggregates sample data on 0 level scores as an achievement indicator (the criterion measure). Using 200 variables he attempts to predict achievement using chi-square analysis. The researcher gets 'close' to his data by making informed decisions during statistical calculation. The process of sequential dichotomisation technique avoids problems of linearity and discontinuity in distributions in variables in the data. Variables are treated as nominal categories and the best prediction for *each* subsample rather than for the entire population (as in linear regression analysis) is judged step by step until all variance in achievement measures is accounted for. This statistical process differs significantly from regression analysis techniques in which data and statistics determine outcome. The style of research is partly artefactual and although it involves the study of samples, its procedures suggest it could adequately complement the description of cases.

A second example relates to the writer's own research. Few case studies have demonstrated a meaningful use of *quantification side by side with experiential or social evidence within the same case.* The futures of quantification in educational research lie in the ability of researchers to develop uses for numerical language *within* N=1 research designs. At the same time the ways in which the two modes of research characterised as experimental (the study of samples) and descriptive (the study of cases), complement each other ought to be more adequately assessed (Cichon and Olson, 1978). In the study of classrooms, management is defined as the ability of the teacher to communicate to the class by his actual behaviour that he is aware of and able to influence what the pupils are doing. This concept is defined by the term "withitness" (Kounin, 1970) and is reflected by pupils on-task behaviour. At the commencement of the school year, teachers initiate (or fail to initiate) management structures resulting in high or low "withitness".

The purpose of studying cases in this research is not to collect speciments of teacher behaviour - the aim of naturalistic inquiry into classroom settings - but to help teachers refine their judgements about their notion of management. Management or "withitness" is therefore used as a contested concept. It is measured using videotape of pupils for whom levels of withitness are recorded from the beginning of the school year. Time series analysis indicates the development of management at different points in time. It also signifies events, that is, substantive historical actions or behaviours in the classroom, possibly indicating periodization. The time series analysis is a form of quasi-experiment (Nordlund and Rönnberg, 1976) which uses chronological time. Subjective and social time are equally as important and all three are used to discover the mediating process in development of classroom norms. A second videotape of the teacher, under his control is used for interview after lessons. Both

scripts are used as primary sources and subjected to the canons of historical criticism. Both forms of evidence from teacher and pupils is used and interpreted interactively with the teacher to explicate the ideas underlying management actions in the classroom.

Making meaning and losing sense with quantification.

Making meaning with numbers can result in sense since many issues which concern case study research involve quantification in an essential way. Description of objects and events often require some form of assessment or measurement involving numerical language expressed implicitly or explicitly. *Future directions for exploring the issue of quantification might focus on the philosophy of number as language.*

There is nothing inherently unacceptable about quantification for the social researcher but making sense of use of its operations has yet to undergo considerable inquiry. The problems to be considered are neither simply technical or intermittent; in making meaning with numbers the assumptions supporting the case study worker's position must be respected; without this, the outcome can only be non-sense.

NOTES:

1. The term 'psycho-statistical' is taken from Fienberg, S.E. (1977) to distinguish the community of researchers who have aligned themselves with a classical and positivist paradigm from the community of scholars who favour descriptive, qualitative and phenomenological approaches.

2. I am using the term issue here in much the same way as Stake (1978) defines it in the CSSE studies Vol.II, C3; "An issue is a circumstance about which people disagree. It usually involves a condition having some features causing (or believed to cause) certain effects. The ingredients for an issue then are the condition, the effects, the relationship between condition and effect, the different valuing, and the alternatives among courses-of-action for changing conditions."

3. Differentiation of knowledge among case researchers is probably due to the fact that many still practise in the name of one of the social science disciplines - psychology, sociology, history...- by imposing a conceptual framework of analysis on their data. In contrast, there is a growing community of scholars whose approach is essentially practical and discipline free (Walker, 1976). This group proposes that it is desirable to develop educational research with its own peculiar authority invested in its researchers and that knowledge from the disciplines can act as "deep background". Each group will have its own purpose in using quantification.

4. Reporting of research has spawned at least four modes of communication (Denny, 1978) including fictionalised accounts (Goodson and Walker, 1978; Walker, 1979). Quantification appears to play no part in this mode and contrasts with the format and style of report the psychometrician whose use of sophisticated statistics is intended to authorise the only readable sections of reporting, the introduction and conclusion.

5. Data may be thought of as information that is standardized; evidence is information that is not comparable and is proper to a single case (Stenhouse, L.; personal communication). In the example cited, if the numbers used were from official statistics such as census data, they would be standardized and comparable with figures for other communities.

6. Descriptive statistics are used to develop associations between objects and categories (means, modes...); the process of statistical measurement may be correlational but is not necessarily inferential where numerical clauses (equations) are used to identify causal relationships.

7. The merger of concept and measurement has at least two important consequences: a) how to conceptualise object phenomena (people, teachers, students...) other than as a set of measurements; and b) by emphasising observable categories, that is behaviours, non-observable phenomena, that is ideas and intentions, are reduced to a lower level of significance.

8. The concept of paradigm is used here to mean the dominant model which defines concepts within that model; concepts have defined meanings which may be known by all people.

9. Non-metric scales are restricted to analysis by nonparametric statistical procedures which require few assumptions about the distribution or level of measurement of the variables (objects, attributes and events): metric scales are restricted to parametric analysis which, theoretically, require more stringent assumptions concerning the distribution. For twenty years, psychologists, sociologists and social scientists, generally, have been grappling with data, for example, with preference and attitude scales and multidimensional scaling, using parametric analysis where, according to psychometric theory,

it ought not be used. The argument is ultimately about whether data measured on an ordinal scale can be (legitimately) analysed with parametric techniques. Researchers who claim it cannot are labelled "purists" "fundamentalists" and advocates of a "weak measurement" approach. Researchers who claim it can are labelled "pragmatists" and advocates of a "strong" measurement approach. The case researcher adopts a "purist" measurement approach. Statistical rules are essentially cumulative; that is, the nominal scale is the "lowest" as a form of measurement but with a limited number of statistics tied to categories but it is the "strongest" since it has fewer problems of validity. By limiting numerical method to nominal levels of measurement and crosstabulation, the case researcher can investigate typicality within and between cases.

REFERENCES:

Ball, S. and Lacey, C. *Subject disciplines as opportunity for group action : a measured critique of subject subcultures.* 1978, Paper presented at S.S.R.C. Conference, Oxford University.

Barraclough, G. *An introduction to contemporary history.* 1967, Pelican, London.

Becker, H.S. *Sociological work.* 1971, Allen Lane, Penguin.

Campbell, D.T. From description to experimentation: interpreting trends as quasi-experiments. In Harris, C.N. (Ed.) *Problems in measuring change.* 1963, Univ. of Wisconsin, Madison.

Campbell, D.T. and Stanley, J.C. *Experimental and quasi-experimental designs for research.* 1966, Rand McNally, Chicago.

Carr, E.H. *What is history?* 1964, Penguin, London.

Chapman, B.L.M. *Some implications of variable interaction for models of learning process.* 1979, British Educational Research Association Conference, Brunel University, England.

Cechon, D.J. and Olson, G.E. Psychometrics and observations: issues in a dual approach to the study of classroom learning environments. *Curriculum Inquiry.* 1978, 8, 2, 133-154.

Cook. T. and Campbell, D. The design and conduct of quasi-experiments and true experiments in field settings. In M. Dunette (ed.) *Handbook of industrial and organizational psychology.* 1976, Rand McNally, Chicago.

Denny, T. *In defence of story telling as a first step in educational research.* Unpublished document.

Evans, J. *Criteria of validity in social research: exploring the ground between ethnographic and quantitative approaches.* 1979, S.S.R.C. Conference, Oxford University.

Fienberg, S.E. The collection and analysis of ethnographic data in educational research. *Anthropology and Education Quarterly,* 1977, 8, 2, 50-57.

Gallie, W.B. *Philosophy and the historical understanding.* 1964, Chatto and Windus, London.

Goodman, L. and Kruskal, W.H. Measures of association for cross classification. *Journal of the American Statistical Association.* 1954, 49, 733-764.

Goodson, I. and Walker, R. *Telling tales.* 1978. S.S.R.C. Conference, Oxford.

Hamilton, D. *Some contrasting assumptions about survey analysis and case study research.* 1976, Mimeo. Centre for Applied Research in Education, University of East Anglia, Norwich.

Kounin, J.S. *Discipline and group management in classrooms.* 1970, Holt, Rinehart and Winston, New York.

Labovitz, S. The assignment of numbers to rank order categories. *American Sociological Review.* 1970, 35, 515-524.

Labovitz, S. Statistical usage in sociology: sacred cows and rituals. *Sociological Method.* 1972, 1, 13-37.

MacDonald, B. and Walker, R. Case study and the social philosophy of educational research. *Cambridge Journal of Education.* 1975, 5, 1, 2-11.

McCutcheon, G. *The disclosure of classroom life.* 1976, Unpublished doctoral dissertation, Stanford University, Univ. Microfilms, 76-26037.

Nordlund, O. and Rönnberg, S. Reasons for N=1 designs in educational research. *Scandinavian Journal of Educational Research.* 1976, 20, 2, 73-83.

Petrie, H.G. Do you see what I see? *Educational Researcher.* 1979, 6, 5, 9-25.

Rolanyi, M. *The tacit dimension.* 1967, Anchor Books, Doubleday, New York.

Sanders, J.R. and Stufflebeam, D.L. School without walls: Columbus Ohio's educational response to energy crisus of 1977. In Stake, R.E. and Easley, J. *Case Studies in Science Education.* 1978a, 1, CIRCE, University of Illinois, 8-12.

Siegel, S. *Non-parametric statistics for the behavioural sciences*. 1956, New York.

Smith, L. Science education in the Alte schools, a kind of case study. In Stake, R.E. and Easley, J.A. *Case Studies in Science Education*. 1978a, Vol.1, C.I.R.C.E., University of Illinois.

Smith, L. An evolving logic of participant observation, educational ethnography and other case studies. In Shulman, L. *Review of Research in Education*. 1978b, Peacock, Itasca, Illinois, 329.

Snow, R.E. Representative and quasi-representative designs for research on teaching. *Review of Educational Research*. 1974, 44, 3, 265-291.

Stake, R.E. The case study method in social inquiry. *Educational Researcher*, 1978a, 7, 2, 5-8.

Stake, R.E. On seeing and measuring. *Journal of Curriculum Studies*, 1978b, 10, 3, 265.

Stake, R.E. and Easley, J.A. *Case studies in Science Education*. 1978, C.I.R.C.E, Illinois, Vols. 1 and 2.

Stenhouse, L. Case study as a basis for research in a theoretical contemporary history of education. *British Educational Research Journal*, 1977, 4, 2, 21-39.

Stenhouse, L. *The study of samples and the study of cases*. 1979a, Presidential Address, British Educational Research Association, Brunel University, England.

Stenhouse, L. *Library access, library use and user education in academic sixth forms*. 1979b, Proposal to the British Library Research and Development Department, Centre for Applied Research, University of East Anglia, Norwich.

Stevens, S.S. On the theory of scales of measurement. *Science*, 1964, 103, 677-680.

Stevens, S.S. Measurement, statistics and a schemapiric view. *Science*, 1968, 161, 849-856.

Walker, R. *Making sense and losing meaning*. 1976, Mineo, Centre for Applied Research in Education, University of East Anglia, Norwich.

Walker, R. *On the uses of fiction in educational research*. 1979, BERA Conference, University of Brunnel, England.

AN ANALYSIS OF VIEWS ON WORK AND UNEMPLOYMENT AMONG SCHOOL LEAVERS IN BRISBANE

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The institution of work has a focal place in Australia. While work is of structural and institutional importance, however, it also has a social-psychological function, the chief outcomes of which are the formation of self-identity, and the gaining of the socially bestowed rewards of status, prestige and respect. The transition from school to work, therefore, is a major one for most individuals. Gorman, for example, has described getting a job for the first time as the equivalent of a *rite de passage* in western industrial societies.[1]

Youth unemployment means that a significant proportion of young people are being denied entry into the world from which most individuals gain these rewards. Yet youth unemployment remains the subject of much debate. A major part of this controversy is the apparent widespread acceptance of the view that youth unemployment is caused by the negative attitudes towards work of young people themselves.[2] Allegations of 'dole bludging' are based, presumably, on an assumption that young people are not motivated to seek work, choosing instead to live on the unemployment benefit.

These allegations imply that there has been a breakdown in traditional values about work and achievement. "Dole bludging' as a phenomenon appears to mark the failure of the social system to win over a sector of the population to these traditional goals, raising questions about the 'work ethic' which has been historically subscribed to in Australia.[3]

Ideologies about work do change through time, in accord with prevailing social conditions. In view of the 'dole bludger' rhetoric, which implies that a change has occurred, this paper presents a sociological analysis of school leavers' views on work and unemployment, derived from a 1978 study. The study was designed as a preliminary step toward a large scale longitudinal study of youth unemployment. The general orientation of this research is that youth unemployment, in its temporal and cultural currency, has an epistemological dimension. Given the structural and institutional importance of work in Australia, the transition from school to work is presumed to incorporate a degree of anticipation as a conscious process. As motivational aspects are largely built into the anticipatory process, through expectation,[4] the specific orientation of this research is to ascertain whether the disturbance of subjectively perceived unemployment has impaired the normative 'work ethic' to the extent of producing anomic tendencies. The purpose, then, is to gauge an *a priori* effect, to establish certain social-psychological constructions of a subjectively perceived experience, and to analyse the influence these might have on motivation.

The motivational aspects of the school leavers' expectations are analysed by reference to Mead's[5] theory of the emergence of self *vis a vis* the 'generalized other', since it was considered that the school leavers might reasonably be expected to have some knowledge of the more controversial factors said to cause youth unemployment. Knowledge, in the sense that Berger and Luckmann[6] use the term, about a problematic situation is thought to be an important element in allowing young people to construct a frame of reference for explaining and understanding their social world. Their epistemological milieu is therefore considered to be part of the phenomenon to be explained at a theoretical level. Then, since there has been little reason until recently to suspect that the motivation of young people may not be able to be successfully integrated with major traditional goals of the social system, the findings are evaluated by applying Habermas'[7] concept of legitimation crisis to the institution of work.

METHODOLOGY

The methodology of the research was designed to give an understanding of the students' own 'construction of reality'[8] prior to the transition from school to the competition for jobs. The methodological directive of Weber[9] that the basic unit of sociological analysis is the individual actor's subjective meaning suggested a data gathering strategy which was unorthodox in terms of qualitative techniques such as those described by Wiseman[10] who stresses the constant interplay of interviewing, transcribing, coding and analysis, and sets down some procedural rules for a simultaneous research act where all these aspects are co-incident. Ideally, this method seeks to generate widely applicable models by scanning and coding data in order to build up clusters of hypotheses. In this way, systematic comparison is actually integrated with the strategy employed for collecting and coding fieldwork observation. The constant comparative method described by Wiseman assumes that selection of contexts in which to seek significant data within the problem area can best be guided by emergent analysis produced concurrently. Any rigorous or systematic attempt to follow the rules of the constant comparative method was considered to be inappropriate to the methodological objectives of this research.

In terms of the stated aim of understanding the students' subjective meaning, an inductive approach was used since it was thought essential to keep topics open during the interviews rather than arrive at a point where they were selected according to some theoretical preference. It was considered to be crucial not to 'home in' on hypotheses which pre-supposed theoretical perspectives. All discussions, whether abstract or anecdotal, had to be regarded as possibly relevant data. This required an impressionability of outlook from the interviewer against the pressure to begin early analysis which is inherent in Wiseman's strategy.

In order to allow for openness and flexibility, the interviews were not structured, thus maximizing the students' opportunities to express their own interests. Interviews began with a question designed to elicit a general world view which produced a variety of paramount concerns, indicating that students did not make selective interpretations about desirable answers. The discussions then followed the parameters which students articulated as being problematic to them, through probes. The tape recorded interviews were edited and typed on transcripts. Statements were coded from the transcripts and those with an unambiguous and similiar meaning were grouped together. While there was a vast amount of superfluous data, the statements which have been used in this analysis are those which were the students' most commonly articulated concerns. This analysis, therefore, focuses primarily on majority statements since it was taken that these represented the areas of vital interest. The data selected for theoretical explanation are those which thematically relate to the following concepts:

. the unemployed
. their own prospect of unemployment

The students' statements around these two concepts produced unexpected data about their commitment to work during the present period of unemployment. In particular a major theoretical construct, related to prevailing ideology about youth unemployment, emerged from the analysis of the data.

Sixty-nine interviews were recorded with 192 students at year 10 and year 12 level from both government and independent schools between September and November, 1978. At the time, the youth unemployment rate was 16.9 per cent.[11] The 13 schools chosen were appropriately spread along a disadvantage-advantage continuum.[12] There is good reason, therefore, to suggest that the sample closely approximates the socio-economic range of the 1978 Brisbane school leaver population.

FINDINGS

The motivational directions of the students are made clear in two ways. First, through their discussions about the unemployed, then second, through an analysis of their subjective perceptions of the prospect of unemployment as it might affect them.

The Unemployed

Because Australian social values have been largely shaped by the 'work ethic', it is not surprising that some sharp distinctions should be drawn by the students between those who want to work and those who are perceived as not wanting to.

....There's a difference: two types ... a dole bludger and an unemployed person

This distinction emerged during approximately half of the interviews and appears to have formed a major typification about the unemployed for these students. The distinction often took on overtones of the old moral one between the 'deserving' and 'undeserving' poor, designed to sort out the genuine from the criminal, a process described by Windschuttle.[13] The students not only made this distinction, but nearly all those who did stressed the idea of compulsory industry, not only for 'dole bludgers', but for all the unemployed.

... They should be made to work for the community good.

While such views are not new, their implications are important.[14] The majority of views expressed on this issue appeared punitive or suggestive of community service as an alternative source of social control to the workforce. The students felt that the unemployed should 'prove' to the community that they were not 'bludging', and indeed should demonstrate a willingness to work by taking this initiative themselves. As one student saw it:

> But if it's true that they really can't get a job...they'll want to go out and do these things.
>
> (year 12 boy, independent school)

Frequently, students expressed doubts about the motives of the unemployed. Approximately one third volunteered statements which implied a denial that unemployment was in any way connected with a contraction of job opportunities.

...There's plenty of jobs... it's just that unemployed people are too choosy.

The recurrent idea was that there were plenty of jobs as long as the unemployed were prepared to exhaust every means of obtaining one and adopted the 'correct' psychological predisposition. The overall view was that unemployment is actually caused by the unemployed person's own reprehensible behaviour. A number of other possible causes of unemployment were suggested, some of which relate to the debate surrounding youth unemployment in particular. For example, married women in the workforce was the second most often cited cause. Other reasons given were general wage rises, lack of experience, over-education, over-population, and the older generation. Where issues such as the lack of jobs, technology, inflation and government economic policy were discussed, the students displayed confusion about the relationships these imply.

When asked directly about the sort of person they thought would be most likely to be unemployed on leaving school, the students further indicated the degree to which they had accepted prevailing ideology about unemployment. They were generally equipped with a number of points which produced a deviant stereotype with exhaustive emphasis on negative personal characteristics. This combination of behaviour and personal characteristics as causing unemployment is part of that process of 'blaming the victim', a process which is frequently seen in Australian society.[15] As could be expected, the dominant feature which

emerged was that the unemployed preferred living on the unemployment benefit to working.

.... They don't really want to work.

The majority of students considered that the unemployment benefit provided a disincentive to an active search for work, and that the alleged behaviour of the unemployed while living on the benefit was hedonistic self indulgence. The students frequently affirmed such activities as 'lazing by the pool', 'going to the beach', and 'drinking in the pub all day'. A couple of students, however, provided an interesting slant to the stereotype which could possibly be unique to Queensland by suggesting that the unemployed were 'the ones who go on street marches and all that'.

One of the most persistent notions communicated by the students was the suggestion of a kind of personal pathology which militated against the chances of success in the competition for jobs. While some students expressed directly the idea that the unemployed thought that 'society owed them a living', most of them portrayed the unemployed as generally lacking in ambition or direction in life. Only one quarter of the students interviewed could be described as having a sympathetic set of attitudes to the unemployed, giving an image of a 'discouraged', 'depressed' and 'defeated' person who has given up under pressure before he or she had really begun.

The Prospect of Unemployment

Only 13 of the 192 students interviewed said they would accept the unemployment benefit if they could not find work, while the remainder rejected the idea outright. While a couple of the 13 students ventured that they thought that living on the unemployment benefit would be like having a holiday, the rest of them implied a conditional acceptance by stating that they would accept the benefit only if their parents let them. These students denied that accepting the benefit would mean 'dole bludging' which indicates an attempt to distance themselves from any notion that they could be accused of the sort of behaviour they had already condemned. Fairly typical of the response is the following statement:

> It's alright if you go on the dole but my parents won't like it, but I'd still be looking for a job. I won't be just having the dole money and spending it, I'll be using it to help me get a job. (year 10 boy, government school)

The students' conditional and moral acceptance of the benefit always portrayed the idea that they, unlike other unemployed people, would be 'deserving'. A 'work ethic' morality was often inherent, as in this statement:

> I'd go on the dole if I had to but at the same time I'd go around and help people, like in the streets, some community work.
>
> (year 10 boy, government school)

When questioned directly about their chances in the competition for jobs, the majority of students indicated degrees of both pessimism and optimism. Pessimism about the situation seemed to reside in the implicit recognition that the going would be tough for them in the competition for jobs; they said that they would have to make an effort, and try hard. Optimism existed in the idea that if they did just that, then they would succeed. What seemed to be occurring with these students was a process of entrepreneurial bargaining in which the situation was pitted against themselves. In other words, the objective structural actuality of unemployment could be solved by their own psychological propensity. This faith in themselves in confronting the contingencies of unemployment is the source of these students' 'great expectations'. Their attitudes represent a subjective construction of unemployment which is quite compatible with the negative moral sanctions expressed about the unemployed. There, as here, the outcome of searching for a job was seen as being dependent on a personal direction, as in the following examples:

I think it's just a matter of trying hard enough. Besides that, there's no use adopting a defeatist attitude before there's any need to

(year 12 boy, government school)

I'd keep looking for a job constantly, going out trying. You've got to have some ambition in life.

(year 10 boy, independent school)

I think if I want to do well, I will. Anybody who puts their effort into it, will. Up to me, really.

(year 12 girl, independent school)

It seemed that anxieties about having to accept the unemployment benefit may have inspired rather than impaired the work motivation of the large majority of students. The strong work motivation was evident in the students' summons to their own highly valued personal qualities to combat the anxieties of unemployment, but once this was in process, unemployment as a personal threat no longer really existed. It could be avoided by the tireless application of worthy attributes, all of which bear a strong relationship to the 'work ethic'.

The most noticeable aspect of the bargaining process was the way in which the students appeared to be having a desperate 'bet' with themselves. The majority of statements, explicitly or implicitly, contained an 'if...then' quality, and the primacy of this form of adjustment deserves some emphasis. The following examples are representative of the students' coping strategy:

If I work hard enough, I'll get there.

(year 12 boy, government school)

I think I'll get where I want to because of pure determination.

(year 12 girl, independent school)

If I am going to make it, I have to make the effort.

(year 12 girl, independent school)

If you're motivated, then you'll get the job.

(year 10 boy, government school)

While the students had presented a composite picture of the unemployed as 'bludging' drop-outs, they amply demonstrated that they themselves did not want to drop out of the system; desperately, they want to get in. While unemployment and the unemployment benefit were rejected as a functional equivalent to having a job, more direct probing concerning the sort of job students would take if they could not get the job they wanted confirms the strong work motivation illustrated in this paper, for example:

I still reckon there are jobs if you don't mind doing anything.

This student was asked how far he would be prepared to go in accepting menial work; sweeping floors for instance:

Yes, that's how far you've got to go if you want to get away from the dole.

(year 12 boy, government school)

Since most people see the primary value of education as the opportunity to achieve occupational success, it was somewhat surprising to find that most students were prepared to lower their expectations in the face of unemployment. This concept of under-employment, that is educational opportunities outstripping employment opportunities which leads to accepting work below the qualifications gained, found ready acceptance.

THEORETICAL ANALYSIS AND CONCLUSIONS

The prevailing ideology about 'dole bludgers' provided a heuristic framework for this research in two major ways. First, the ideology appeared to suggest that young people were motivationally impaired to the extent that they no longer adhered to traditional system goal values about work. Second, it seemed

to suggest that if this were the case, that there may be a weakening of the bonds of social attachment, indicating a break in the ideological relations which secure the commitment of hard working individuals important to the continued existence of an industrial system. Since ideologies do change through time, it was assumed at the outset of this research that 'dole bludger' ideology implied a transformation of the 'work ethic' congruent with the structural actualities of what Bell[16] has called the 'post industrial society'.

The main finding of this research is that the impact of high rates of youth unemployment has been conducive to promoting strong work motivation tendencies in the large majority of students. The purpose here is to analyse at a theoretical level some implications of this finding since it was considered that the students' epistemological milieu might also be part of the phenomenon to be explained. This explanation is derived from the work of Mead and Habermas. Mead's[17] interactionist approach is relevant since he tends to view behaviour from the standpoint of the individual facing the situation. The focus is on the meaning that individuals assign which allows for an appreciation of the play of human purpose and motivation. Since, as Habermas[18] states, motivations are shaped through the structures of expectation, the constraints under which these exist might also be a crucial aspect of theoretical analysis, particularly as they relate to the concept of a legitimation crisis.

According to Habermas,[19] problems which represent crises occur only if they cannot be solved within the scope that is contained by the 'organizational principle' of that social system. He does not concern himself with the notion of crisis each time there is a functional disturbance in the social system which could be overcome within the framework of normative structures. He argues specifically that a crisis occurs only if the organizational principle reaches certain limits. A first condition in the prediction of a legitimation crisis is the loss of a coherent grasp of identity-securing referents which then creates personal insecurities. He states:

> Disturbances of system integration endanger continued existence only to the extent that social integration is at stake, that is, when the consensual foundations of normative structures are so much impaired that the society becomes anomic.[20]

Unemployment, then, represents a crisis only if, as a structural problem, it is felt individually in this way. While unemployment is a structural objectivity arising from what Habermas[21] might call an 'unresolved steering problem', it reaches crisis proportions only if it affects individual consciousness in a specific way. Elaborating on this, it seems that the avoidance of crisis could depend on an interpretation of the unemployment problem which could still secure identity and be efficacious for social integration. In other words, if the socio-cultural system cannot any longer produce the adequate motivations for the work institution, a crisis can only be avoided if 'scarce meaning' is replaced.[22] Habermas is quite explicit in asserting that it is ultimately the 'substitutive relation between the scarce resources, value and meaning' which is decisive for the prediction of crisis. To defend the statement that motivations may have been eroded, Habermas suggests that:

> . it must be demonstrated that traditions in the context of attitudes previously produced have been eroded.
>
> . it must be shown that there are no functional equivalents for the spent traditions for they are precluded by the development of normative structures.[23]

From the theoretical discussion so far, it is possible to make a hypothetical statement which grounds

prevailing ideology about youth unemployment. The proposition is that the disturbance of subjectively perceived unemployment has impaired the motivational tendencies of the normative work ethic to the extent of producing anomic tendencies. To the extent that anomic tendencies have been produced they will be discernible in students' views that acceptance of the unemployment benefit as an alternative form of income is a functional equivalent to work. To the extent that this is perceived, it may then be stated that a crisis exists in a motivational deficit towards traditional goals. This will be indicated through observation that legitimations previously accorded to the work institution *viz.*, the means by which material well being, status and identity are achieved, have been withdrawn.

These theoretically generated hypotheses, which arise from a widely accepted public and political belief concerning the cause of youth unemployment, are not supported by the data. The main finding of this research, that the impact of high rates of youth unemployment appears to have promoted strong work motivation tendencies in the large majority of students, is strengthened by a number of empirical observations:

1. The overall view that unemployment could be avoided by adopting the 'correct' psychological disposition.
2. The majority of students rejected the suggestion of living on the unemployment benefit.
3. Only 13 out of 192 students accepted the suggestion of living on the unemployment benefit.

In the attempt to apply Habermas' more global concept, it was thought that the avoidance of crisis, felt as personal insecurity, was dependent upon the substitutive relation between work and unemployment; that is, a particular interpretation of the unemployment problem could still secure identity and be efficacious for socialintegration. The problemis not the one suggested by the 'dole bludger' ideology concerning the motivation of young people and its implied crisis of legitimation in the substitution of work and unemployment. Given the structural actuality of youth unemployment, that a substantial proportion of young people who leave school at the present time face the possibility of an average 23 weeks without a job,[24] the phenomenon to be explained at a theoretical level is why there is not a crisis in legitimation. In other words, it is the strong work motivational tendencies of the students, facing the situation, which have to be explained.

From Mead's theory it is possible to derive the idea that motivational directions are likely to be influenced by the desire to attain a secure self-concept since his theory is basically an account of the degree to which the self is defined in the socialization process. The central focus is the process by which an individual's notion of self emerges through creation of and response to others' images of who the individual is. Mead's account of the emergence of self is developed through an elucidation of forms of intersubjective activity which render the reflexive objectification of the self possible.[25] The key process in the generation of self consciousness is role playing. It is only by taking the role of others that an individual becomes an object to him or herself.[26] While the students' statements about the unemployed indicate that there was no subjective identification with them, their advancement of the most convenient reason for unemployment, that is, 'dole bludging' appears as a prudent adjustement since as Mead said, individuals are able to see the situation they are in, by taking the role of the other. This ability, however, to look at oneself objectively, is achieved in the context of a generalized conception

of society. Using the term, the 'generalized other', Mead[27] represents this to mean the organized and generalized attitudes in reference to which the individual defines his or her own conduct.

The students' response to the 'generalized other' is observed in their apprehension of their own prospect of unemployment. The chaotic conditions under which this was apprehended did indeed produce personal insecurity. Their response to this, however, was not the state of anomie which might lead to the emergence of new normative structures concerning work. The reponse was a command to ceaseless effort which was coupled with a lack of any noticeable discontent and is thoroughly congruent with the 'work ethic'. Insecurity about unemployment, and anxiety about the possibility of having to accept the unemployment benefit are the two factors which appear to be connected with the strong work motivation evinced by these students. Being unemployed meant not only having to accept the hostile label of the 'generalized other', but the displeasure of 'significant others' as well. In order to avoid such censure, the students said they were prepared to lower their aspirations and accept any sort of work because it was preferable to being unemployed.

While Mead suggested that self consciousness is attained when the individual can view him or herself from the standpoint of the 'generalized other', it is also clear that the rise of the self *vis a vis* the 'generalised other' is a condition of social control of the individual.[28] This aspect of Mead's theory is evident in the students' highly motivated presentation of self, explicitly organized around critical judgements about how they could morally contribute to the situation under the circumstances of their own unemployment. While one third of the students were either optimistic *or* pessimistic about their chances in the competition for jobs, a significant two thirds made a conflict-laden response. This majority recognized that their chances might be difficult and they were pessimistic in that respect. Optimism, however, was implied by the idea that the solution was dependent on personal qualities. The 'if...then' statements, in particular, illustrate this process, and reflect clearly the demands of the situation, not its constraints.

The students' attitudes affirm a 'work ethic' in which expectations of self are subordinated to individual discipline. By negotiating their chances at a personal level to combat insecurity, and not at the structural source, these students have given an interpretation of the unemployment problem which grounds their own identity in the expectations of the 'generalized other'. By ordering the chaotic intrusion of unemployment through an assertion of valued personal attributes as a 'solution', the students were basically claiming that being unemployed will not be their fault since they will have done all they could to avoid it. The students' response is unrealistic for its inability to comprehend that the application of 'work ethic' qualities cannot solve a structural problem in a social system which now appears to have an inbuilt incapacity to use all its labour. The application of 'work ethic' qualities can only increase the chances of success for some students in the competition for jobs, they cannot guarantee it. The motivational level students have cannot, of itself, change a ratio of unemployed juniors to unfilled job vacancies of 34:1.[29]

The empirical conclusions illustrate the importance of selecting a school leaver sample rather than a sample of young unemployed. By establishing that an oversupply of motivation to work exists *a priori*, it then follows that motivational impairment which occurs after the transition is likely to have an experiential source; that is, it can now be hypothesized that motivation is influenced by the search for work

or work itself. The data suggest that the actual experience of the search for work threatens to undermine the self concept of highly motivated students, since the motivation produced must clearly out-run present opportunities for many young people. Those students who do experience unemployment will have to modify their concept of self or their motivation to work.

This study has illustrated how youth unemployment has served to reinforce the motivation necessary for the successful continuance of the work institution. The students' fear of unemployment and its stigma has produced motivational tendencies which are functional to the social system's goal values. The immunizing power of ideological distortion has suspended doubt and upholds the legitimacy of the system, by shifting reponsibility from critical involvement with the social-structural source of a problematic situation to the individual, which exaggerates the role he or she can realistically hope to play.[30]

NOTES

1. Gorman, A., "Social Aspects of Youth Unemployment", in R.F. Henderson (ed.), *Youth Unemployment: Proceedings of the Second Academy Symposium*, Academy of the Social Sciences in Australia, 1977, p 66. See also Van Gennep, A., *Les Rites de Passage*, Chicago: University of Chicago Press, 1960. Sociologists have taken Van Gennep's concept to entail movement into a different part of a social structure; the loss or gain of a privilege, influence or power; and a change in identity or self. See, for example, Glaser, B.G., & Strauss, A., *Status Passage*, London: Routledge and Kegan Paul, 1971, Ch.8.

2. Since 1975, opinion polls have consistently recorded that between 40 and 50 percent of Australians thought that the main cause of unemployment, particularly youth unemployment, was that the unemployed 'don't want to work'. See Windschuttle, K., *Unemployment: A Social and Political Analysis of the Economic Crisis in Australia*, Australia: Penguin Books, 1979, p155. See also, McCallum, M., "Dole Bludging: A politically inspired myth', *The National Times*, 21.10.80, p.25.

3. The term 'work ethic' is popularly used to describe western concepts of work which have been developed historically in association with the growth of trade, technology and industrialization. Its meaning has been traced to the teachings of Luther and Calvin and can be understood as a command to enduring effort while at the same time renouncing the rewards of labour. This paradox was claimed by Weber to be important in the ideological justification of industrial capitalism. See Weber, M., *The Protestant Ethic and the Spirit of Capitalism*, New York: Charles Scribner's Sons, 1958, p2.

4. Habermas, J., *Legitimation Crisis*, Boston: Beacon Press, 1975, p95.

5. Mead, G.H., *Mind, Self and Society*, Vol. 1., Chicago: University of Chicago Press, 1974.

6. Berger, P., & Luckmann, T., *The Social Construction of Reality*, Great Britain: Penguin University Books, 1975, p15. Berger & Luckmann describe the way in which members of society use commonsense knowledge in everyday life to construct the socially shared sense of reality.

7. Habermas, J., op. cit., 1975.

8. Berger, P., & Luckmann, T., op. cit., 1975, p13.

9. Weber, M., op. cit., Weber believed meanings to be the primary determinants of individual actions. The method he developed for discovering social meanings is called *verstehen* which is revealed in his study of Protestantism and the spirit of capitalism.

10. Wiseman, J.P., "The Research Web, *Urban Life and Culture*, Vol 3, No.3, 1974-75, pp317-328. The method is oriented towards generating hypotheses or 'discovering grounded theory' rather than testing them. See also Glaser, B.G., & Strauss, A., *The Discovery of Grounded Theory : Strategies for Qualitative Research*, Chicago: Aldine Publishing Co., 1967.

11. Australian Bureau of Statistics, *Unemployment, September, 1978*, (Preliminary Estimates), Catalogue No. 6201.0.

12. The 13 schools comprised 5 government schools and 8 independent schools. It proved to be more difficult to persuade independent school principals to allow more interviews. In order to make the independent school sample comparable in numbers with the government school sample, more independent schools were included. 103 government school students and 89 independent school students comprised the final sample.

13. Windschuttle, K., op. cit., 1979, p 217.

14. Community service during the present unemployment crisis was first suggested during the 1974 federal election campaign when the then Leader of the Opposition, Billy Snedden, proposed an Australian Aid Corps scheme for young people to undertake community service work. The proposal was really a version of a proposed civilian alternative to National Service suggested by Phillip Lynch when he was Minister for Labour and National Service in 1972.

15. Ryan, W., *Blaming the Victim*, New York: Pantheon Books, 1971, p 3 - 24.

16. Bell, D., *The Coming of Post-Industrial Society*, New York: Basic Books Inc., 1973.

17. Mead, G.H., op. cit., 1974.

18. Habermas, J., op. cit., 1975, p 95.

19. ibid., 1975, p 7.

20. ibid., 1975, p 3.

21. ibid., 1975, p 5.

22. ibid., 1975, p 93.

23. ibid., 1975, p 10.

24. Australian Bureau of Statistics, *The Labour Forces, Australia*, 1980, Catalogue No. 6203. 0.

25. Mead, G.H., op. cit., 1974, pp 148-164. Mead refers to the concepts; language, play and the game.

26. ibid., 1974, p 151.

27. ibid., 1974, p 195.

28. Hansen, D.A., An Invitation to Critical Sociology, U.S.A : The Free Press, 1976, p 35.

29. Department of Employment and Youth Affairs, *Monthly Review of the Employment Situation*, July, 1980.

30. Habermas, J., *Theory and Practice*, Great Britain: Heinnemann Educational Books, 1974, p 12.

SOCIAL BACKGROUND, ASPIRATIONS AND EDUCATIONAL ACHIEVEMENT AMONG QUEENSLAND YOUTH

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Introduction

The aim of this paper is to present some preliminary analyses of data concerning social origins, educational aspirations and educational achievements of a cohort of Queensland youth. This data was collected as the first phase of a longitudinal investigation* of the processes by which the social origins of individuals influence their capacities and achievements in both the educational and occupational spheres. Currently this sample of Queensland young people is being contacted concerning early work or higher education experience. It is also proposed in this study to contact the sample again late in 1981 and then in 1984 by which time the bulk of those who entered full-time tertiary education in 1979 will have graduated. The results of these further investigations will be reported in later papers.

Theoretical Framework

The people involved in the process of transition from schools to tertiary education are the students themselves, their peers and families, their teachers and guidance officers and tertiary education personnel. This transition is a process involving decisions which are difficult, important and perhaps irrevocable.

The aspirations, plans and career decisions of young people have been the subject of a large amount of research and writing. One theme in this literature concerns the planned, rational and purposive nature of such career plans (Blau et al., 1956). A second characterization has viewed these processes as more spontaneous and non-rational, whereby individuals are seen as "drifting" into tertiary education for example by virtue of situational pressures (Caplow, 1954). A third approach relates educational/occupational aspirations to individual human development (Crites, 1969), while a further theme relates educational and job aspirations and plans to personality type by suggesting that specific personality types are most compatible with certain occupations and thus seek them out (Holland, 1973).

More recently, both within Australia and overseas countries, especially the United States, the transition from high school to tertiary education has been the subject of several large-scale investigations making use of sophisticated multivariate techniques of data analysis (e.g. Sewell and Hauser, 1975; Griffin and Alexander, 1978; Meade, 1978; Otto and Haller, 1979; Thomas, 1979; Thomas, Alexander and Echland, 1979; Anderson et al., 1980). Such studies have relevance to the present investigation as have others in the status attainment tradition (Blau and Duncan, 1967; Alexander and Echland, 1975; Jones et al., 1977; Featherman and Hauser, 1978; Brown et al., 1980; Halsey et al., 1980; Williams et al., 1980). Amongst these studies, that of Sewell and Hauser (1975) is of particular relevance to the present research as it highlights the need to examine the impact of both social

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background and social psychological characteristics and experiences in any study of youth's aspirations and achievements.

The approach adopted to the aspirations and plans of young people in the present investigation is that both aspirations and career choices are moulded by the structures of society, i.e. by the nature of the economic system in general and the types and status of occupations to which youth with different social characteristics aspire. Such characteristics, viewed as external influences over which the individual has little or no control, are seen to constrain the kinds of educational/occupational choices and decisions individuals make.

For example, the social class milieu in which an individual is reared has often been highlighted as representing a major constraint upon both occupational and educational aspirations and achievements. Various status attainment studies have shown that social class funnels young people towards particular amounts and types of education which then affect their early occupational achievements; these career beginnings subsequently exert major impact on later career achievement. In particular, as Anderson et al. note (1980:66), there is "almost a surfeit of evidence in Australia concerning the hegemony exercised by upper socio-economic levels of society upon participation in tertiary education."

Secondly, as sociologists have long asserted, families are basic units in the social stratification system. The family of origin is one of the very few ascriptive groups to which members of modern society belong and it has been shown to have both direct and indirect effects on the status attainment and prestige of its members. Parental encouragement of education, the availability of reading material, parental educational level and what has been termed the "cultural level of the home" (Keeves, 1978) all affect educational attainment and intellectual performance. What should be highlighted is that children from high status homes are those most likely to benefit from such environmental presses for educational achievement. In fact, Williams (1976) has proposed that such children receive from their parents not only a genetic endowment and are reared in a more educative environment, but are further advantaged by their ability to influence their home environment so as to further their own intellectual development.

Like social class, schooling has also been shown to affect young people's aspirations, plans and achievements. As several researchers have shown, the system of schooling in Australia is a manifestation of the wider social structure and is one factor helping explain why certain persons are more likely than others to proceed to tertiary education. A recent review of the effect of private schooling on the status attainment process in the United States (Lewis and Wanner, 1979) indicates that it is not clear whether private schooling, as distinct from public schooling, actually increases its graduates' chances for success. In much of the relevant literature is the presumption that private schools serve to perpetuate advantage by means of a unique socialization experience and social contacts unavailable elsewhere and that these factors give the private school graduate an advantage in the status attainment process. Be that as it may, Williams and his associates (1980:108-109) have demonstrated the apparent advantages of non-government schooling in Australia by showing differences in average levels of student achievement attributable to the non-government schools themselves rather than merely to the characteristics of the students attending them.

Further, differential sex role socialization, ethnicity, race and geographical location have all been shown in Australia to have important consequences for youth aspirations and achievements. The gap between the sexes in terms of numbers in both senior high school and tertiary education has all but closed but

there is still disparity between the sexes in the subjects studied in Year 12 of high school and in the courses and types of institutions chosen in tertiary education. The available evidence in Australia shows marked differences to exist at the secondary school level among students from southern European migrant backgrounds compared to their peers of Australian origin. What is also clear is that there is a large gap between the aspirations of the former group and their educational achievements (Martin and Meade, 1979). On the other hand, of course, Aboriginal youth in Australia do not achieve satisfactorily in Australian schools nor proceed in any numbers to tertiary education. Finally, as Beswick (1975) has pointed out, geographical location seems to exercise its main effect in Australia on retention rates to Year 12 of high school rather than on the transition from high school to tertiary education. Some recent evidence, however (Williams et al., 1980:109), shows that coming from a rural family or attending a rural school does not affect to any large extent such students' learning of basic skills.

A social-psychological view of status attainment also draws attention to the importance of what are often termed "significant others" on the aspirations and achievements of youth. Parental encouragement for higher education has been shown in many studies to act as an intervening variable between students' social backgrounds and their plans for tertiary education. Teachers have been shown to be affected in their development of expectations about students proceeding to tertiary education by individual students' scholastic performance and ability and the classroom groups to which students belong. The influence of peers on educational/occupational plans has also been a feature of many studies. Such influence has been found to occur via peer modelling behaviour which often supports parental influence or aspirations. Peer influence has also been suggested as the medium for the structural effects of school social class composition on educational aspirations although Alexander and his associates' (1979) painstaking examination of this phenomenon suggests that school socio-economic influences on both plans and curriculum placement result to a very large degree from the social class differences in the types of students going to such schools.

Theoretical Model

The considerations outlined above have guided the present investigation and the formulation of a theoretical model encompassing the following variables and possible patterns of influence.

Firstly, for the purposes of this paper, it is suggested that sex, geographical location, father's occupation, father's and mother's education and family income all influence the type of school attended by an individual and that person's interest in schooling.

Secondly, it is suggested that all these factors affect the influence of parents, teachers and peers and that, thirdly, this complete set of factors affects the student's educational plans. The assumption here, derived from Sewell, Haller and Portes (1968), is that students develop and adjust their educational expectations according, not only to their own assessment of their abilites, but also according to the evaluations of others.

Finally, it is hypothesized that social background, school, significant others and educational plans all affect the student's achievement at the completion of Year 12 of high school. In this investigation this is measured by each student's rescaled aggregate score, which is the student's aggregate of adjusted marks in twenty semester units in the last two years of high school rescaled according to his school's performance on the Australian Scholastic Aptitude Test. This rescaled

aggregate score is an appropriate basis for comparisons across all Year 12 students in Queensland (McGaw, 1977). The major dependent variable which, it is suggested, is affected by all the variables named before it, is initial enrolment in tertiary education. Such a variable marks an important transitional point in each person's career. In short, the named variables have been ordered in a causal, recursive, path analytic scheme which parallels many models of status attainment.

Methodology and Data Source

In november 1978, 1,286 Year 12 students in 26 schools across Queensland were selected.* This sample was drawn with a probability proportional to the size of the Year 12 group in each school. It also reflected the proportion of Year 12 students in different types of schools (State, Catholic and other independent), metropolitan versus non-metropolitan differences and sex differences. Using procedures suggested by both Rosier and Williams (1973) and Ross (1978) we estimated the design effect of the multiple stages of sampling used in this study in an effort to establish the size of the simple random sample with the sampling precision equivalent to the sampling procedure used here. This value of the size of the simple equivalent sample (n = 218) would be used in determining appropriate degrees of freedom for tests of significance.

Information on each student in the sample was derived from a survey in November 1978 concerning each student's social origins, plans, and attitudes to school and tertiary education. In March 1979 information was obtained concerning each student's Year 12 results, higher education preferences and admission or non-admission to tertiary education. Later in 1979 a selection of information from the 1976 Census concerning each student's broad area of residence was added to the data file.

Table 1 sets out the variables included in the theoretical model predicting entrance to tertiary education, their labels and a brief description of their measurements.

Table 1: Measurement of Variables in the Model

Variable Label	Variable Name	Measurement	Description
Dac Occ.	Father's occupation	Occupational prestige scores ANU-1 Scale (see Brown et al., 1977)	Low score = Professional High score = Labourer
Dad Quals	Father's educational qualifications	A scale ranging from 1 to 4	1 = None 4 = Tertiary qualifications
Mum Quals	Mother's educational qualifications	"	"
Loc.	Location	Respondent's home address	1 = Brisbane metropolitan area 2 = Outside Brisbane metropolitan area
Faminc.	Family income	A scale from 1 to 5 measuring respondent's perception of family's wealth compared to other families in the community	1 = Considerably above average 5 = Considerably below average

(continued)

*We wish to acknowledge the help of Dr Malcolm Rosier of the A.C.E.R. in constructing this sample.

Table 1: Measurement of Variables in the Model (continued)

Variable Label	Variable Name	Measurement	Description
Area Wealth	Average family income of respondent's area of residence	A scale from 1 to 10 measuring percentage of families in respondent's area of residence whose annual income exceeded $12,000. Data derived from 1976 Census figures for Queensland Local Government areas	1 = < 14% of families having incomes greater than $12,000 p.a. 10 = > 34% of families having incomes greater than $12,000 p.a.
Govt School	Government high school	School attended by respondent in November 1978	1 = Non-government school 2 = Government high school
Indep. School	Non-government, non-Catholic secondary school	"	1 = Government or Catholic secondary school 2 = Independent secondary school
Int. in School	Interest in Year 12 studies	A scale from 1 to 5	1 = Interested in none of Year 12 work 5 = Interested in all of Year 12 work
Parent Influence	Parent influence	A scale from 1 to 5 measuring respondent's perceptions of parental support for his/her going on to tertiary education	1 = Parents will not let me go on to tertiary education 5 = Parents want me to go on to tertiary education
Frenplan	Friends' plans	A scale from 1 to 5 measuring respondent's perceptions of the post-Year 12 plans of friends re tertiary education	1 = Most of my friends are planning not to enter tertiary education 5 = Most of my friends plan to enter tertiary education
Teacher Influence	Teacher influence	A scale from 1 to 3 measuring respondent's perception of his/her going on to tertiary education	1 = Teachers encouraged me to go on. 3 = Teachers have had no effect on my decision.
My op. myabil.	Opinion of academic ability	A scale from 1 to 6 measuring respondent's opinion of own ability	1 = Ability is believed to be far below average 6 = Ability is believed to be far above average
Ed. plans	Plans for tertiary education	Question asking information for respondent's post-Year 12 plans	1 = Enter tertiary education at once 2 = All other plans
Year 12 Achiev.	Year 12 achievement	Respondent's rescaled aggregate score at completion of senior high school (see text)	Ranges from low to high scores
Tertiary Entry	Tertiary entrance	Acceptance of a place in 1979 in a Queensland tertiary institution	1 = Gained entrance to tertiary education 2 = Did not.

Results

The coefficients of determination (R^2) for the recursive structural models of entrance to tertiary education are displayed in Table 2.

On the basis of the proportion of variance explained by the selected independent variables, the model has been more successful in accounting for variance in tertiary education attendance among men (47.5 per cent) than among women (44.9 per cent). Table 2 shows that for men the individual's educational plans make the greatest contribution to this variance, followed by the influence of significant others and achievement at the end of Year 12 of high school. School variables, social background and the individual's assessment of his own ability make much smaller contributions to the

Table 2: Coefficients of Determinations* for the recursive structural Models of tertiary Education Attendance for Men and Women

Independent Variables	R^2	
	Men (n = 570)[a]	Women (n = 480)[a]
Social background	.030	.036
School	.037	.026
Significant other influences	.132**	.124**
Assessment of own ability	.024**	.066**
Educational plans	.153**	.127**
Year 12 achievement	.099**	.070**
Total	.475	.449

*Following Kerlinger and Pedhazur (1973) the addition of variance at each step was tested for significance. The ** denotes that the extra variance explained at that step added significantly to the model.

[a]The original subsamples of 595 men and 486 women were reduced to 570 and 480 respectively as a result of using the regression program's "listwise deletion" technique which eliminated from calculations cases with missing values on any variables.

total variance explained. For women, educational plans, significant other influences and Year 12 achievement in that order are also the major contributors to the explained variance, followed by the individual's assessment of her own ability, social background and the school variables.

The differences between the models for men and women are interesting. While educational plans in both models make the greatest contribution to the explained variance, a finding which Thomas (1980) has also reported in a related investigation among a sample of American college entrants, such plans have a stronger impact for men. Among women the perceived influence of parents, teachers and peers is almost as important as plans (12.4 per cent variance vs 12.7 per cent) but among men the effect of perceived influence is less strong (13.2 per cent variance vs 15.3 per cent). Among men, Year 12 results account for a greater proportion of the total variance explained (9.9 per cent out of 47.5 per cent) than does the corresponding variable in the structural equation for women (7 per cent out of 44.9 per cent). It is also worth noting that individuals' assessments of own academic abilities assume greater importance in the model for women than for men. Conversely, the school variables ("type of school" and "interest in school work") have a greater impact for men than for women in explaining variance in tertiary education entry.

In short, the model is more successful in predicting tertiary entrance for men than for women and within each separate model, the relative impact of the selected independent variables varies, quite possibly indicating different processes of educational socialization and achievement among men and women. Further, in terms of the variance explained in tertiary education entry by the respective models, the results in Table 2 show the major role played by student educational plans, significant other influences and individual assessments of academic ability, compared to the structural variables of social background. Such a finding supports Thomas's (1980) recent analyses but does not support Kerckhoff's (1976) earlier hypothesis that social structural factors have a greater effect on educational outcomes than do personal influence and socialization variables.

While Table 2 presented the aggregate effects of the different classes of independent variables included in the model, Table 3 provides the standardized coefficients for each variable separately and the changes in these coefficients which follow from the stepwise introduction of different classes of variables in the hypothesized causal sequence. Table 4 (appended) reports the corresponding unstandardized coefficients which are more appropriate for between-group comparisons (Blalock, 1967). Significant path coefficients ranging between ± 0.02 and ± 0.09 are considered as having a "small" effect, while coefficients ranging between ± 0.10 and ± 0.25 are described as having a "modest" effect. Coefficients of ± 0.26 and above are viewed as having a "substantial" effect. In comparing coefficients within and between groups, the arbitrary value differences of ± 0.04 and above will be considered adequate for suggesting standardized coefficients differ significantly within groups. Following Thomas (1980), such a procedure will also be used for between-group comparisons, providing the unstandardized values are consistent with the interpretations based on the path coefficients.

Table 3: Standardized Coefficients representing selected Influences on tertiary education Attendance for Men (M) and Women (*F*)

Independent Variables		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Dad Occ.	M	.044	.026	.066	.001	-.023	-.026
	F	*.007*	*-.001*	*-.019*	*-.002*	*-.028*	*0.064*
Dad Quals.	M	-.024	-.039	.016	.016	.003	.009
	F	*-.048*	*-.045*	*-.025*	*-.016*	*.008*	*.0002*
Mum Quals.	M	-.094*	-.089*	-.063	-.053	-.049	-.032
	F	*-.109**	*-.104**	*-.034*	*-.032*	*-.008*	*.001*
Loc.	M	-.030	-.034	-.026	-.027	-.040	.003
	F	*-.144**	*-.121**	*-.065*	*-.068*	*-.020*	*-.010*
Faminc	M	.091*	.065	.045	.026	.024	.060*
	F	*.016*	*.003*	*.006*	*-.013*	*.011*	*-.006*
Area Wealth	M	-.026	-.027	-.004	-.001	.001	.032
	F	*-.136**	*-.139**	*-.085**	*-.081**	*-.058*	*-.033*
Govt School	M		.131*	.126*	.130*	.099*	.062*
	F		*.042*	*.026*	*.049*	*.048*	*.081*
Indep. School	M		.003	.056	.053	.008	-.034
	F		*-.023*	*-.002*	*-.003*	*.039*	*.058*
Int. in School	M		-.151*	-.093*	-.090*	-.053*	-.020
	F		*-.152**	*-.070**	*-.018*	*.008*	*-.006*
Parent infl.	M			-.302*	-.294*	-.121*	-.094*
	F			*-.249**	*-.222**	*-.091**	*-.093**
Frenplan	M			-.110*	-.101*	-.027	.009
	F			*-.161**	*-.147**	*-.082**	*-.058*
Teacher infl.	M			.101*	.079*	.010	-.040
	F			*.167**	*.107**	*.057**	*.006*
My op. myabil.	M				-.159*	-.075	.006
	F				*-.276**	*-.229**	*-.066*
Ed. plans	M					.476*	.345*
	F					*.422**	*.320**
Year 12 achiev.	M						-.407*
	F						*-.360**
R^2	M	.030	.066	.198	.222	.375	.475
	F	*.036*	*.061*	*.186*	*.251*	*.378*	*.449*

* P < .01

An examination of the first step of the causal sequence in Table 3 at which the effects of family and relative affluence of the area in which the home is located are considered shows that for men, mother's qualifications and family income have significant, if small, effects on entrance to tertiary

education. For men, having a mother with a tertiary education and coming from a relatively affluent family as indicated by income predict success in gaining a place in a tertiary educational institution in Queensland in 1979. Among women, mother's qualifications exercises a modest effect on tertiary entrance as does home location and the relative affluence of the area in which the home is found. In concrete terms these latter results mean that girls from outside Brisbane are more likely to enter tertiary education than girls resident in Brisbane and that coming from an area where over one-third of families earns more than $12,000 per annum is an advantage in securing a place in a tertiary course.

When the variables relating to the type of school and interest in Year 12 studies are added into the equation, mother's qualifications still has a direct and significant effect on tertiary entrance for both groups, although the metric coefficients show the effect to be slightly larger for women than men. Similarly, among women home location and area wealth continue to have modest, direct effects on tertiary education entrance. However the addition of the school variables results in a reduction in value of the significant coefficients of both mother's qualifications and home location for women and of family income for men suggesting that these variables in the causal sequence are being mediated by the school variables. For both men and women, interest in school has moderate, significant effects on tertiary entrance, students being interested in all their work being markedly more likely to gain a place at university or C.A.E. than their contemporaries who were interested in very little or none of their work. For men, attending a government school rather than a Catholic or independent school is associated significantly with failure to gain entrance to tertiary education.

The introduction of variables measuring the effect of parents, friends and teacher's perceived influence is such that the direct effects of both social background and school variables on tertiary entrance are reduced while the influence variables themselves exercise modest to substantial effects on the dependent variable. For example, among men, the direct effect of a better educated mother is reduced by 30 per cent (path coefficients drop from -.089 to -.063) while the effect of interest in school declines by 40 per cent (-.151 to -.093). Among women, the introduction of the perceived influence variables results in a decrease in the direct effects of mother's qualifications, home location, area wealth and school interest. The path coefficients in Step 3 of Table 3 reveal that parent influence is significantly greater than peer and teacher influence among both groups while among men, peer influence is only marginally greater than the perceived effect of teachers on entrance to tertiary education, this latter result being reversed among women.

The introduction of the self-assessment measure (opinion of own ability) causes small reductions in the effects of perceived parent and peer influences in both groups, but a substantial reduction in the direct effect of teacher's influence among men, and, among women, of the direct effects of interest in school. Overall, the direct effect of self-assessment on tertiary entrance is substantially greater for women than for men.

At this stage in the elaboration of the model it is clear that neither the perceived influence variables nor academic self-assessment have fully accounted for the effects of socio-economic origins or schooling on tertiary entrance. Community wealth still exercises a small but significant direct effect on girls entering tertiary education while among men attending a government school and interest in schooling also continue to have direct effects. It is as well to remember in interpreting the effects of attendance at a government school that the manner in which the variable is scored means that it is non-

attendance at a government school that is predicting entrance to tertiary education.

When educational plans are entered into the equation (Step 5) they become the prime determinant of tertiary entrance for men and women though the effect is larger for the former. This variable also mediates much of the effects of area wealth among women, government school attendance and interest in schooling among men, and the perceived influence and self-assessment variables among both groups. The mediation of the effects of significant others, schooling and self-assessment continues when the final variable, Year 12 achievement, is added to the equation. This variable also reduces substantially the effects of educational plans on tertiary entrance, although it should be noted that for both groups in this final elaboration of the model educational plans is the second most powerful predictor of tertiary entrance. The only structural variables which have significant independent effects in the fully elaborated model are, for both groups, type of school attended and, for men only, family income. For men, coming from wealthy homes and having attended other than State schools are significant independent predictors of entrance into the tertiary education system; for women, only attendance at other than a State school has this effect.

Conclusion

The results displayed in Table 2 showed the effects of the selected classes of variables upon tertiary entrance for men and women separately. The coefficients displayed in Tables 3 and 4 have highlighted the relationships among these variables.

Among men, having a better educated mother and coming from a well-off family are a decided advantage in ensuring entrance to the tertiary education system. The latter variable exercises a direct effect even in the fully elaborated model. Attendance at a government school is not an advantage and this also continues to exercise a small, direct and significant effect when the model is fully elaborated. The encouragement of parents, peer modelling and teacher encouragement are all important. They mediate some of the effects of both type of school and school interest but are themselves, especially the influence of peers and teachers, largely accounted for by assessment of one's own ability, educational aspirations and final high school results. In their turn, self-assessment and aspirations are affected by school results, though parental encouragement and aspirations still exercise direct effects, the latter being quite significant.

In a broad sense the pattern is similar for women. Aspirations and final school results are the major direct effects on tertiary entrance and government schooling also displays a small direct effect in the fully elaborated model. However, the peer modelling impact is not entirely mediated by self-assessment, aspirations and school results and along with parental encouragement continues to exercise a direct effect on tertiary entrance. Further, perceived teacher influence is not entirely accounted for by aspirations as is virtually the case among men who, it would appear absorb the encouragement of teachers in the formation of aspirations to a greater degree than do women. Indeed, while parents exercise a direct effect in both groups, among girls the peer group, and to a lesser extent teachers, also exercise direct effects on tertiary entrance. Perhaps the socialization experiences of girls make them more amenable or susceptible than boys to interpersonal influences.

In summary, as a considerable body of literature suggests, tertiary entrance is positively related to aspects of social background, though that influence is largely mediated by the social psychological

processes specified in the present model. Academic self-assessment is a stronger mechanism for women than for men but is clearly influenced by the opinions of significant others as these are expressed in encouragement to continue education after Year 12. And, as we have suggested, the formation of educational aspirations occurs differently for women compared to men. Among men aspirations are formed in the framework of what friends are planning and teacher encouragement. Among women the influence of peers and teachers is not absorbed entirely either by final school achievement or aspiration formation.

Appendix A

Table 4: Metric Coefficients representing selected Influences on tertiary Education for Men (M) and Women (*F*)

Independent Variables		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Dad occ.	M	.005	.003	.001	.0001	-.003	-.0003
	F	*.001*	*-.0001*	*-.002*	*-.0001*	*-.002*	*-.006*
Dad Quals	M	-.009	-.016	.007	.007	.001	.004
	F	*-.023*	*-.021*	*-.012*	*-.008*	*.004*	*.0001*
Mum Quals	M	-.051	-.048	-.034	-.028	-.026	-.017
	F	*-.067*	*-.064*	*-.021*	*-.019*	*-.005*	*-.0005*
Loc.	M	-.030	-.034	-.026	-.027	-.040	.003
	F	*-.144*	*-.120*	*-.004*	*-.008*	*-.020*	*-.009*
Faminc	M	.061	.043	.030	.017	.016	.039
	F	*.012*	*.002*	*.004*	*-.009*	*.008*	*-.004*
Area Wealth	M	-.004	-.004	-.001	-.0001	.002	.005
	F	*-.025*	*-.025*	*-.015*	*-.015*	*-.010*	*-.006*
Govt school	M		.131	.126	.129	.099	.062
	F		*.058*	*.036*	*.068*	*.067*	*.112*
Indep. school	M		.004	.072	.069	.010	-.044
	F		*-.046*	*-.018*	*-.005*	*.078*	*.114*
Int. in school	M		-.092	-.057	-.055	-.032	-.013
	F		*-.111*	*-.051*	*-.013*	*.006*	*-.005*
Parent infl.	M			-.120	-.117	-.048	-.037
	F			*-.103*	*-.092*	*-.038*	*-.039*
Frenplan	M			-.024	-.023	-.006	.002
	F			*-.033*	*-.030*	*-.017*	*-.012*
Teacher infl.	M			.055	.043	.005	-.021
	F			*.086*	*.065*	*.029*	*.003*
My op. myabil	M				-.093	-.043	.026
	F				*-.192*	*-.160*	*-.046*
Ed. plans	M					.475	.344
	F					*.418*	*.317*
Year 12 achiev.	M						-.001
	F						*-.001*

References

Alexander, K.L. and Echland, B.K., Basic attainment processes: a replication and extension. Sociology of Education, 48 (4): 1975, 457-495.

Alexander, K.L., Fennessey, J., McDill, E.L. and D'Amico, R.J., School socioeconomic status influences: composition or context? Sociology of Education, 52: October, 1979, 222-237.

Anderson, D.S., Boven, R., Fensham, P.J. and Powell, J.P., Students in Australian higher education - a study of their social composition since the abolition of fees. E.R.D.C. Report, No. 23. Canberra: Australian Government Publishing Service, 1980.

Beswick, D.G., Expectations and realities of transition to tertiary education, in Anderson, D.S. et al., Regional Colleges: a study of non-metropolitan colleges of advanced education in Australia, Vol. 3. Canberra: Australian National University.

Blalock, H.M., Path coefficients vs regression coefficients, American Journal of Sociology, 72: 1967, 675-676.

Blau, P. et al., Occupational Choice: A Conceptual Framework. Industrial and Labor Relations Review, 9: 431-543.

Blau, P.M. and Duncan, O.D., The American Occupational Structure. New York: John Wiley and Sons, 1967.

Broom, L. et al., Investigating Social Mobility. Canberra, A.N.U. Press, 1977.

Broom, L., Jones, F.L., McDonnell, P. and Williams, T., The Inheritance of Inequality. London: Routledge and Kegan Paul, 1980.

Caplow, T., The Sociology of Work. Minneapolis: University of Minnesota Press, 1954.

Crites, J.O., Vocational Psychology. New York: McGraw-Hill, 1969.

Featherman, D.L. and Hauser, R.M., Opportunity and Change. New York: Academic Press, 1978.

Griffin, L.J. and Alexander, K.A., Schooling and socioeconomic attainments: high school and college influences. American Journal of Sociology, 84: 1978, 319-347.

Halsey, A.H., Heath, A.F. and Ridge, J.M., Origins and destinations: family, class and education in modern Britain. Oxford: Clarendon Press, 1980.

Holland, J.L., Making Vocational Choices: A Theory of Careers. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.

Jones, F.L., McDonnell, P. and Williams, T., Occupational achievement and economic rewards: some social determinants, in Tucker, K.A. (ed.), Economics of the Australian service sector: Australian Studies in Economics. London: Croom Helm, 1977, pp.53-75.

Keeves, J.P., Home background and the outcomes of schooling, in Quality in Australian education. Melbourne: Australian College of Education, 1978, pp.95-115.

Kerckhoff, A.C., The status attainment process: socialization or allocation? Social Forces, 55 (2): 1976, 368-381.

Kerlinger, F.N. and Pedhazur, E.J., Multiple Regression in behavioral research. New York: Holt, Rinehart & Winston, 1973.

Lewis, L.S. and Wanner, R.A., Private schooling and the status attainment process. Sociology of Education, 52 (2): 1979, 99-112.

Lewis, R., Transition from school to tertiary education in Australia. Hawthorn, Vic.: A.C.E.R., 1976.

Martin, J.I. and Meade, P., The educational experiences of Sydney high school students. Canberra: Australian Government Publishing Service, 1979.

McGaw, B., The use of rescaled teacher assessments in the admission of students to tertiary study. Australian Journal of Education, 21 (3): 1977, 209-225.

Meade, P., Youth, education and life chances. Kensington, Sydney: University of New South Wales, 1978.

Otto, L.B. and Haller, A.O., Evidence for a social psychological view of the status attainment process: four studies compared. Social Forces, 57: March, 1979, 887-914.

Rosier, M.J. and Williams, W.H., The sampling and administration of the I.E.A. science project in Australia 1970: a technical report. Melbourne: A.C.E.R., 1973.

Ross, K.N., Sample design for educational survey research. Evaluation in Education: International Progress, 2 (2): 1978, 105-195.

Sewell, W.H., Haller, A.O. and Portes, A., The educational and early occupational attainment process, American Socio. Review, 34: February, 1969, 82-92.

Sewell, W.H. and Hauser, R.M., Education, occupation and earnings: achievement in the early career. New York: Academic Press, 1975.

Thomas, G.E., Influence of ascription, achievement and educational expectations on black-white post secondary enrolments. Sociological Quarterly, 20: Spring, 1979, 209-222.

Thomas, G.E., Alexander, K.L. and Echland, B.K., Access to higher education: the importance of race, sex, social class and academic credentials. School Review, 87: February, 1979, 133-156.

Williams, T., Abilities and environments, in Sewell, W.H., Hauser, R.M. and Featherman, D.L., Schooling and achievement in American society. New York: Academic Press, 1976, pp.61-102.

Williams, T., Clancy, J., Batten, M. and Girling-Butcher, S., School, work and career - seventeen-year-olds in Australia, A.C.E.R. Research Monograph No. 6. Hawthorn, Vic.: A.C.E.R., 1980.

VOCATIONAL PREPARATION AND EMPLOYMENT OF PHYSICALLY HANDICAPPED STUDENTS EDUCATED IN REGULAR SCHOOL SETTINGS IN QUEENSLAND

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In the late sixties, a number of students attending the State School for Spastic Children, New Farm, Brisbane, were integrated into regular primary and secondary education facilities throughout Queensland. These first efforts to integrate physically handicapped individuals occurred largely as a result of the philosophical commitment to integration by certain people in the Queensland Education Department's then Guidance and Special Education Branch, and the enthusiastic support of some of the parents of these cerebral palsied students. These initial attempts to integrate relatively few handicapped children at later stages of their education contrast quite significantly with the current situation in Queensland where almost half the cerebral palsied students in regular primary education are in their first or second year of school. At present, handicapped children are being integrated fairly successfully at the pre-school level and continue in the regular primary stream until such time as the child is deemed better placed in a Special Education facility. More children with a far greater range of handicap are being integrated into regular education at an earlier age and there is little doubt that a significant number of these children will complete their education in the regular stream. To date very little is known of the impact these children are going to have on regular education or about the difficulties they will encounter, particularly in the areas of vocational preparation and employment.

Purpose

One purpose of the study was to gain insight into vocational preparation needs of a group of cerebral palsied young adults who had completed, or were close to completing their formal education in an integrated setting. Although integration into regular education has a clearly established philosophical basis, research attempts to provide an empirical base have proved fruitless largely because of methodological problems. The present study has attempted to make some assessment of the value of integration as it pertains to vocational placement by investigating attitudes to integration, current circumstances and problems of cerebral palsied young adults.

Sample

The defining characteristic of the sample of cerebral palsied persons being studied was their having been integrated into regular primary and secondary schools throughout Queensland following attendance at the State School for Spastic Children at New Farm, Brisbane. The cerebral palsied, by virtue of the nature of their condition, are a group with a considerable range of physical, social-emotional, intellectual and academic abilities. Discussion with Department of Education personnel who were active in the early attempts to integrate these students enabled the compilation through consensus of a set of

student characteristics which at the time were believed to be desirable if integration was to succeed. Not all of these characteristics were necessarily present in every student but integration was implemented if the students possessed strengths which compensated for any deficiencies. The basic characteristics of the group who were selected for integration appears to have been:

(a) reasonable mobility

(b) basic academic competence

(c) social competence

(d) parent request that the child be integrated or parent support when integration was suggested.

In a couple of instances, students were integrated because their parents were transferred to locations where segregated facilities did not exist.

Swan (1978) investigated the academic standards and attitudes of teachers and students to the majority of those people who were integrated in the late sixties and early seventies. These 30 subjects in Swan's study have been followed up wherever possible with the ultimate intention of combining the studies to produce a longitudinal investigation of the group.

Some 15 of the original sample of 30 cerebral palsied students were traced and agreed to be interviewed. Their ages ranged from 15 to 24 years; 8 were female and 7 were male.

Procedure

A relatively small subject population combined with great diversity of individual abilities and educational experiences, prompted the development of a small group study where subjects were individually interviewed by a person with counsellor training and experience in order to encourage the subject to communicate in detail on issues significant to that individual. Where it was believed the issues were of limited significance, only minimum discussion would be necessary, but where significant issues emerged, the use of effective communication skills by the interviewer was expected to promote discussion and enable a clearer understanding of the issues than would be achieved by more controlled research procedures.

Interview Schedule

A trial interview schedule aimed at investigating the subject's current circumstances, attitudes to integration and issues which in the literature suggested possible difficulty, was devised. After four interviews the schedule was slightly modified in order to deal specifically with those issues which then seemed to be more significant than was originally believed.

The final form contained 19 discussion points covering six broad interest areas; educational history, current circumstances, attitudes to educational integration, academic issues, interpersonal relationships, and the transition from school to work.

Results and Discussion

Several issues related to vocational development emerged from the information obtained through the interviews, including inadequate preparation for integrated educational placement, inappropriate teacher expectations, minimal and inadequate vocational guidance, lack of pre-vocational skill training and inappropriate curricula. These issues are discussed below in the light of relevant research literature.

1. Integration Into The Regular School

In Queensland, the issue of integration has relevance to vocational development as Special Schools in the state have a long history of providing vocational development programs for their handicapped students. Generally children in most special schools commence vocational training at about nine years of age and by the time the child is ready to leave school, at fifteen or sixteen, the network of employment opportunities in the local community, which has been developed by the school staff over the years, provides numerous opportunities for job placement. This contrasts significantly with the academic and non-vocational orientation of many regular high schools.

Historically, the emergence of the civil rights movement in the United States in the sixties is considered significant in promoting increased tolerance towards minority groups, equality of opportunity and elimination of discrimination. Based on these changing social perspectives educators soon began to question the efficacy of special class placements for the handicapped. Dunn (1968) for instance, forcefully argued that many segregated special classes had become the dumping ground for handicapped children who had been placed there largely for the convenience of the regular school administrators and their class teachers. In effect, he argues, the regular school's solution to its problems has been to transfer rather than to solve. Furthermore, there has been an unwarranted tendency to sterotype many categories of handicap, and differential teacher attitudes based upon these labels were detected (Foster, Ysseldyke & Reese, 1975). Supporters of integration frequently cite instances of institutional neglect of segregated groups and the difficulties experienced by people who have been labelled as different, or who have limited social experiences (Abeson & Zettel, 1977). On the other hand, there has been growing acceptance of the principle of normalization (Wolfensberger, 1972).

The handicapped individual benefits more from an integrated environment where it is necessary to learn to cope with experiences that are as close to normal as possible and where it is believed the increased contact with the community will ultimately promote greater acceptance.

Unfortunately, very little research evidence exists to suggest there are clear advantages of integration over segregation, and most of the studies are related to the educational provisions of the educable mentally handicapped.

Scriven (1976) notes that there is considerable inadequacy in the methodology on which most of these studies are based. The inability to control key variables such as class size, per capital expenditure and selection procedures has frequently rendered the research in the area inadequate and inconclusive. It is becoming apparent that the almost infinite number of uncontrolled variables make this task an impossibility (Cruickshank, 1976). We believe Semmel, Gottlieb and Robinson (1979) are correct in their conclusion that a policy of educational integration, while in compliance with contemporary moral and legal prerogatives, lacks any empirical base.

The Queensland Department of Education, principally through its Division of Special Education provides support services to children with special needs. In the publication, Special Education in Queensland - 1978, which is a handbook giving descriptive information and policy statements on Special Education in the State, numerous positive references are made to integration and in addition there are numerous suggestions of an ongoing commitment to its further development. The Director-General of Education advocated a policy of increased integration, but one that is to be realized gradually and not through a major shift in the pattern of service provision.

In our study, assessment of the subjects' general attitude to their integration was undertaken by asking them for what they consider were the favourable or unfavourable characteristics of their integration. This issue was addressed early in the interview before areas of potential difficulty were considered an no specific or leading questions were added. Although early adjustment problems were frequently mentioned, the positive long term value of the experience in terms of learning how to cope in a regular environment appears to have been quite significant. Twelve subjects made positive statements indicating the value of integration in providing experiences which promote normalization. The following statement by a 21 year old moderately handicapped female with spastic quadriplegia, well illustrates the important issues.

> "I have never experienced anything like it! It was so different from the Spastic Centre. In the normal school you are not much different from the others. You learn to cope, to be independent and mix with people".

Of the three who did not mention the normalization issue, two are living in a normalized* manner, both being in regular employment and having a wide range of normal social experiences. One commented in a fairly neutral way that his regular education was no problem educationally or socially and the other believed any problems he did experience were the result of his father being the policeman in a small town and not because of his handicap. The third subject, was subjected to some rather brutal and inexcusable treatment by a particular teacher and all comments were of a negative nature concerning this particular teacher.

The generally positive attitude to integration, particularly the favourable light in which the normalization issue has been perceived, suggests it is a significant positive factor even when many of the problems these people encountered are taken into account.

2. Curriculum

A basic aspect of youth unemployment is the issue of curriculum priorities in secondary school. Perhaps the situation for the handicapped is best summed up Loring (1975) who in arguing for the need to look carefully at the curriculum said;

> "If the physical capabilities of the handicapped child are lower than his intellectual ones, but by pursuing a programme for his emotional and physical development and social integration to the full we find him a job, whereas the development of his intellectual capacity at the expense of the other areas does not, I wonder which goal the child would choose." P. 68

Literature on vocational development and employment of the handicapped often supports the need to go beyond the academic program and to develop courses containing distinct social and vocational training components.

The influential Warnock Report (1978) on the special educational needs of handicapped children and young people in Great Britain suggested the importance of developing social competence and vocational interests, in addition to basic educational skills for those children with special needs, be they in regular or special schools. Careful planning was advocated in order that career opportunities were not narrowed by any restriction of educational opportunities.

*normalized refers to the philosophical position introduced by Nirje (1970) and further developed by Wolfensberger (1972)

Information from our study suggested there was very little alteration to the academic orientation of the programs in regular secondary education to meet the specific needs of these students. Only one student received any form of work experience. He is now in sheltered employment at the Spastic Centre even though he received an excellent report from the music store where he was employed. Two other students who were placed in a high school which offered a modified curriculum and took four years to complete the normal three year academic program to grade 10. Half the subjects rated their academic performance at less than average and of these three indicated they had considerable difficulties with their formal school work. Quite probably about half the students could have benefited from some alternative curriculum for with the combination of limited to average academic competence, a physical hardicap and few marketable vocational skills, the chances of employment are fairly limited in the current environment.

3. Counselling and Vocational Development

Over the last decade there has been a steady growth in the provision of guidance and counselling services to all secondary schools throughout Queensland. Currently most state secondary schools in Queensland have a full-time guidance officer in attendance or at least regular part-time guidance support. However, the situation in independent and church schools, although improving, is far less developed than the state system and frequently students have to rely on Commonwealth Employment Services for vocational assessment. The views of specialists with rehabilitation and social work backgrounds tend to indicate that the counsellor of the physically hanidcapped requires additional skills in long-term counselling and specialized assessment in order to operate effectively. Vocational evaluation and preparation for school leaving should be commenced in the pre-adolescent phase when it is felt both students and parents are likely to be less emotionally involved and more likely to accept the realities of the situation (McLarty & Chaney, 1974; Cruickshank, 1976; Morgan, 1974; Wilson, 1970).

Activities that have been proposed as bieng important prevocational activities for the physically handicapped person include:

(i) Appraisal of strengths and weaknesses in order to ascertain those broad areas that are vocationally possible, and to work with the individual and his family concerning realistic goals. (McLarty & Chaney, 1974; Cohen, 1976; Cruickshank, 1976; Morgan, 1974).

(ii) The need for consistent counselling so that parents and young people won't shop around for advice which promises that which is not realistically possible. (Morgan, 1974).

(iii) The need for prevocational experiences in order to develop the work habits and social skills necessary in order to obtain and maintain employment. (McLarty & Chaney, 1974; Cohen, 1976; Wilson, 1970).

The age at which these developments are most appropriately introduced appears to be in the middle primary school years with continuation on into the secondary school. McLarty & Chaney (1974) mention programs developed by Kramer (1962) in which a group of disabled persons between nine and sixteen years was placed in a summer pre-vocational program for two and a half hours each day, three days a week. In this simulated work environment they worked on an assembly line, punched time cards and worked towards production targets. In this way it was believed the children would gain experience in development work habits, tolerance, responsibility and social skills.

When the issue of vocational training was discussed 10 subjects made statemtnts which were either critical of the wholly academic orientation of the curriculum or specifically expressed the need for

some vocational preparation while at school. Some vocational counselling was available in the state education system but in the private schools such assistance was virtually absent. Other than a single visit to Commonwealth Employment Service for assessment by two subjects, the 7 who attended private schools were given no professional assistance.

The nature of the assistance given by guidance personnel in the State system tends to fall far short of the form which is advocated in the literature. Traditionally this form of counselling has been undertaken by personnel in the rehabilitation field and secondary school counsellors have little experience in dealing with the additional difficulties that vocational development poses for handicapped students. Even current literature from the United States where the legislative dictates of Public Law 94-142 provides considerably greater pressures for integrating the handicapped than do existing provisions in Australia, little reference is still made to the specific issues of counselling the handicapped. This is an area that the school counselling profession has yet to come to terms with.

All the state high school students reported some vocational assistance, however in almost every instance the student was given the same general assessment and advice as other students. In one case a student was given individual advice, although this did not include an individual assessment. He was simply advised that he had to get into his head that he had as much chance of getting a job as the next person. For a person with severely deformed legs, and considerable mobility problems, and barely average academic competence this type of advice is not a realistic appreciation of the limitations caused by his physical handicap. He is currently employed in one of the Spastic Centres sheltered workshops in Brisbane.

In the last two years, the changes that have occurred in vocational development in Queensland have been considerable. Figure 1, which outlines the vocational options for students with special needs, provides a description of the range of programs being offered to students by the Division of Special Education.

As mentioned previously there has been a traditional vocational orientation in the curriculum of the state's special schools. From about nine years of age many students in special schools receive training in woodwork, metal work, cooking, sewing and craft activities. Work experience and transition education have usually been a part of the system although the degree of involvement in these fields does vary somewhat from school to school. Special school personnel traditionally have taken upon themselves the responsibility of trying to locate employment for their students and consequently special school personnel have developed quite a considerable range of contacts with prospective employers willing to take special students. Perhaps more importantly, over the years, these teachers have developed competencies in vocational assessment and vocational preparation. Unfortunately, few persons with equivalent competence currently exist in the regular school system.

A significant proportion of the subjects in the present study probably would have benefited from vocational development and experiences of a type which are not envisaged for non-handicapped students in regular education. When one considers the current situation where many more handicapped students with greater degrees of disability are being placed in regular schools, the problem must inevitably magnify.

4. The Transition from School To Work

The recent report on Education, Training and Unemployment (Williams, 1979) after noting the unrealistic ideas about vocational opportunities held by many handicapped children, the great variety of such

handicaps and their consequential effect upon vocational potential, recommended that there be an extension of vocational guidance and counselling for handicapped students. As has been noted previously, the issue of counselling the handicapped is a long-term, complex procedure requiring certain specialized skills and consequently, one might predict difficulties for secondary school guidance officers. Even with some specialized training working in high schools in a general capacity with infrequent contact with students who have specific types of handicaps, may prevent the development of the necessary skills.

The Warnock Report (1978), recommended at least one careers teacher in each high school with additional training or expertise in understanding the career implications of different types of disability or disorder and this acknowledged the need for specialized skills in this form of assistance. However, when students as diverse as, for instance, the cerebral palsied are considered, it is difficult to see specialist careers teachers having the necessary breadth of experience to cope, especially as the recommendation on this form of involvement regarded only the two years prior to leaving school as the critical period.

In response to the needs of many handicapped students for further educational and work opportunities, the Williams Committee recommended the extension of existing special education programs beyond the school leaving age, their provision in a vocational setting and the development of new assessment procedures to help in the placement of handicapped persons in employment. Co-operation between Commonwealth Employment Service and Technical and Further Education authorities may assist towards the provision of co-ordinated programs of technical and further education, assessment and placement. Many of the initiatives which are being funded on the basis of these and other recommendations of the Williams Report may be expected to be invaluable, but it is difficult to see actions taken only in the final few years of a handicapped student's formal education as being effective. Workskills take much longer to develop, parents frequently have unrealistic expectations about their handicapped child, society is often prejudiced in its attitude to the employment of the handicapped and the overprotective attitudes of so many who have contact with handicapped persons adversely affect social development. These are but a few of the additional problems faced by many handicapped persons.

Questions in our study concerning employment and the transition from school to work show that 8 of the subjects in the study found employment in the open workforce. However it must be remembered that 8 were in the jobmarket by 1975 and did not face the fierce competition that exists in the jobmarket today. The basic criterion for successful employment appears to be academic competence. Those three subjects who achieved above average academic standards either went onto tertiary study or obtained employment directly. Two reported difficulty in obtaining work because of the reluctance of employers to employ a handicapped person. However, with their sound academic qualifications, both found regular employment fairly quickly. The picture for the 12 average or less than average students was far more gloomy. Nine reported difficulty in obtaining employment and the issue of employers being reluctant to employ handicapped people was frequently mentioned. An eighteen year old female subject with mild hemiplegia affecting her left side, made this statement;

> "People aren't prepared to take a chance. Because your physically handicapped they think you are mentally handicapped. They seem impressed with my skills at the interview but you hear no more from them".

This girl successfully completed a twelve month business college course following grade 10.

Since then she has been unable to find employment.

Two were eventually able to find regular employment through relatives and neighbours, and four eventually found open employment. Five of these people sought assessments from the vocational assessment unit at the Spastic Centre in Brisbane and have obtained employment in a sheltered workshop situation. One subject succiently described his position this way. "My alternatives were very limited. It was either the dole or here with a pension". This same student commented that, in retrospect, he would have preferred to have gone to a special school and received some vocational training rather than to have gone to a regular school, although academically he did not experience excessive difficulty at a regular high school.

To the advocates of normalization, seeing these people return to a sheltered environment after such an extensive period of interaction with regular society, would be a quite unsatisfactory outcome. However, to the handicapped person, the decision is probably quite a reasonable one and, in the short term, the development of skills in the sheltered workshop could be invaluable. Unfortunately, once in sheltered employment, there is a general reluctance for handicapped people to try for open employment because of the difficulties in obtaining the invalid pension again if the job trial fails. Thus, the sheltered work environment, which could play a very useful role in the transition to open employment, unfortunately tends to become permanent.

5. Student Preparation for Integration and Teacher Attitudes

Two issues which were given little attention in the literature, yet were areas of concern to some subjects in the study, were the degree to which students were prepared for the transition to the regular school environment and the attitudes of regular school teachers to handicapped students.

The transfer from the sheltered environment of the Spastic Centre School into regular education, proved rather difficult for many subjects. Eight mentioned a wide range of problems which included additional homework demands, unexpectedly high standards within the regular school and the pressures of keeping up with peers in task completion. Two subjects were critical of the lack of preparation they received at the State School for Spastic Children for meeting these demands. Teacher attitudes were viewed favourably by most subjects who believed they were treated equally with their peers. However, six subjects reported instances of teachers having unrealistically low expectations or being over-protective, with the result they were allowed to avoid activities which they believed they were capable of attempting. One subject regarded this need to be treated equally as being extremely important as peers tend to be upset by differing standards and social problems can ensue. No doubt some form of preparation of both the student and the teaching staff prior to integration, would go a long way towards alleviating these types of difficulties.

6. Vocational Development of Handicapped Students in Regular Schools

In attempting to find answers to these problems we are immediately faced with a dilemma. If the principle of normalization which Wolfensberger (1972) argues is of fundamental significance, and which the views of the subjects in this study tend to confirm, to what extent should normalization principles be comprised in order to provide additional vocational development options for certain students? Given the way in which certain vocational options have been well established in special education facilities and are most unlikely of being established in regular education, particularly in the middle and upper primary years, it suggests there probably will have to be some recognition of the need for special

assistance within the regular school. However, the primary option would be to maintain the student in the regular stream if the resources available adequately meet the needs of the student.

Figure 1 does not provide a complete account of services being offered by the Division of Special Education. The options available to students in Charleville, for instance, are different from those available to students in Brisbane. Work experience opportunities, T.A.F.E. facilities, the attitudes of the community, principals, and teachers are but a few of the factors contributing to the uniqueness of each situation. Such a situation precludes the development of centrally organized, state-wide solutions to these issues.

Possible approaches which might have general applicability but could be modified to the needs and resources of the local community might include:

(1) creating awareness in regular education of the need for a vocational development option for academically less able handicapped students from about the middle primary years onward;

(2) upgrading the skills of visiting teachers, primary and secondary guidance officers who as the special education personnel in contact with regular education would be capable of co-ordinated efforts to identify and act on the vocational needs of these handicapped students;

(3) employing regionally-based personnel who could tap into the resources of an existing vocational development program to assess needs and to co-ordinate appropriate vocational development and work experience programs for those students in regular education, where the vocational training provisions of regular education are considered not in keeping with their needs;

(4) developing channels by which the professional skills of occupational therapists, social workers and rehabilitation personnel could be incorporated into the assessment process;

(5) providing early and ongoing parent and student counselling.

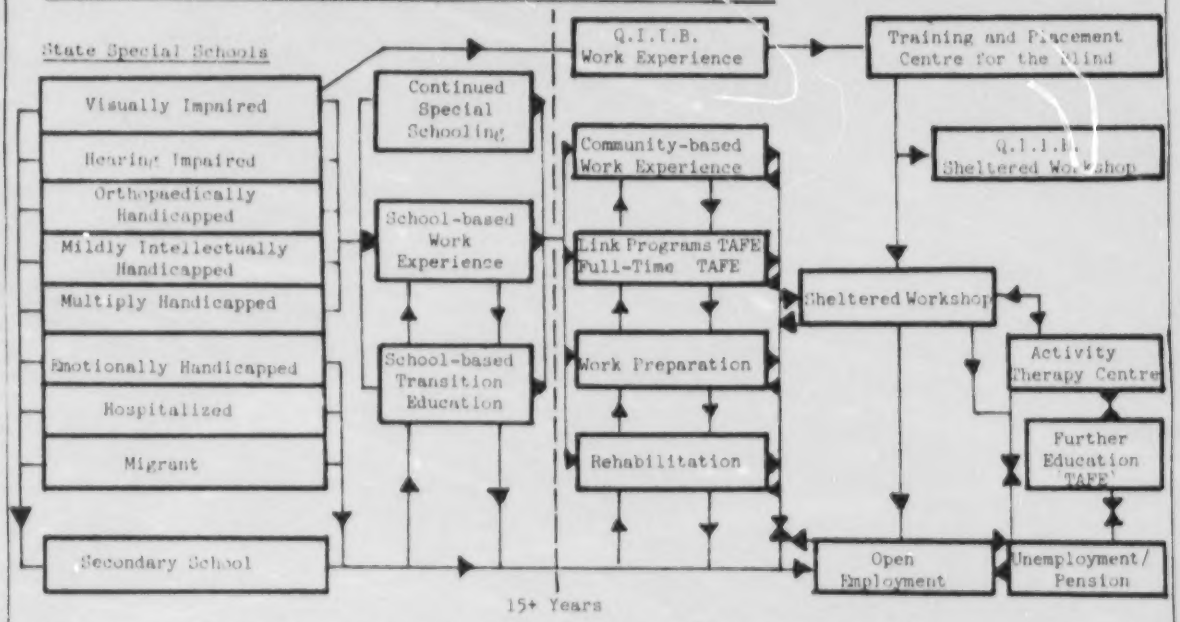
Although outside its terms of reference, the Williams Committee observed the need for Commonwealth and State agencies to establish centres to co-ordinate education, employment, medical and social-security services for the handicapped. This is an essential step if service provision is to be sufficiently flexible to meet individual needs and to overcome the current situation where services are disjointed, at times competitive, and on occasions even opposed to the objectives of other services.

Conclusion

Interviews were conducted with young adults who were among the first students with cerebral palsy to be systematically integrated into regular schools after having been educated previously in a special school for spastic children. Several needs were identified as crucial to providing appropriate vocational preparation for such physically handicapped students and some suggestions were made as to how integrated students might be better served by special education support personnel. The study also illustrates the value of long-term follow-up of the clients of special programs to guide policy and curriculum decision-making.

Figure 1

Vocational Options for Handicapped Children in Queensland - May 1980



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References

ABESON, A., & Zettel, J. The Quiet Revolution: Handicapped Children Act of 1975. Exceptional Children, 44, 115-128, 1977.

COHEN, J.J. Vocational Guidance and Employment. In W.M. Cruickshank (ed), Cerebral Palsy. A Developmental Disability (3rd ed), Syracuse University Press, New York, 1976.

CRUICKSHANK, W.M. The Problem and Its Scope. In W.M. Cruickshank (ed), Cerebral Palsy. A Developmental Disability (3rd ed), Syracuse University Press, New York, 1976.

DUNN, L.M. Special Education for the Mildly Retarded - Is Much Of It Justifiable? Exceptional Children, 35, 5-22, 1968.

FOSTER, G., Yaseldyke, J.W., & Reese, J. I Never Would Have Seen It If I Hadn't Believed It. Exceptional Children, 41, 469-473, 1975.

KRAMER, J. Work Experience for the Teenager. In Work Adjustment as a Function of Occupational Therapy, Study Course No. 5. World Federation of Occupational Therapy, 1962.

LORING, J. The Problem of the Multiple-Handicapped Child. In J. Loring and G. Burns (eds) Integration of the Handicapped Child in Society, Routledge & Kegan Paul Ltd., London, 1975.

McLARTY, C.L. & Chaney, J.A. The Cerebral Palsied. In J.G. Cull & R.E. Hardy (eds) Severe Disabilities, Social & Rehabilitative Approaches, Thomas, Springfield, Illinois, 1974.

MORGAN, M.R. Like Other School Leavers? In D.M. Boswell & J.M. Wingrove (eds) Integration of Handicapped Children in Society, Routledge & Kegan Paul Ltd., London, 1975.

NIRJE, B. The Normalization Principle: Implications and Comments. Journal of Mental Subnormality, 16, 62-70, 1970.

QUEENSLAND Department of Education, Special Education in Queensland - 1978, Brisbane, 1978

SCRIVEN, M. Some Issues in the Logic and Ethics of Mainstreaming. Proceedings from the July 1975 Deans Project Conference sponsored by the Leadership Training Institute, Uni. of Minnesota, 1976.

SEMMEL, M.I., Gottlieb, J., & Robinson, N.M. Mainstreaming: Perspectives on Educating Handicapped Children in the Public School. In D.C. Berliner (ed). Review of Research in Education, 7, 1979, American Educational Research Association, 1979.

SWAN, G.J. Cerebral Palsy - Integration. Unpublished M. Ed. Admin. Thesis, Uni. of Queensland, 1978.

WARNOCK, H.M. Special Education Needs. Report of the Committee of Enquiry into the Education of Handicapped Children and Young People. Her Majesty's Stationary Office, London, 1978.

WILLIAMS, B.K. Education, Training and Employment. Report of the Committee of Inquiry into Education and Training, Australian Government Publishing Service, Canberra, 1979.

WILSON, M.M. Children with Cerebral Palsy. Education Survey 7, Her Majesty's Stationary Office, 1970.

WOLFENSBERGER, W. The Principle of Normalization in Human Services. National Institute on Mental Retardation, Toronto, Canada, 1972.

A RESPONSE MODEL AND SOME APPLICATIONS IN ELEMENTARY MATHEMATICS AND HISTORY

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Introduction

Most school tasks involve learning of some kind; it might be rote learning, the learning of skills, meaningful learning, learning by discovery, learning of established bodies of knowledge, learning values and attitudes, or learning how to get on with others. This paper is concerned with the meaningful learning of existing knowledge; and in particular with the reasoning that the student displays in using that learning. While this does not cover all school learning, it incorporates a very important part of school learning.

The average classroom in which content instruction takes place contains children of different abilities and interests in the subject being taught. Some children may not have an understanding of prerequisite concepts; the quality of teaching can vary tremendously; classroom tests are usually carried out on a group basis; and classroom tests frequently incorporate items worded so that higher order levels of thinking and judgment are not called for. For these, and other, reasons teachers will find that students, at all levels, primary through to tertiary, often perform at a disappointingly low standard in terms of Piaget's developmental criteria.

It is not just a matter of getting students to give the "correct" response to an item: many responses can be "correct" in some sense, but some responses are clearly of a better quality than others. This qualitative difference is often meant to be reflected in grading. A mark of "A" reflects the fact that an essay, or other test performance, is better than one that gains a "C" or "Pass" - both responses might be technically correct. We do not mean that this difference implies that the "A" student has answered with more recalled items of information, but that the better response has a more complex structure. Our studies suggest that the structures Piaget observed in responses to his tasks may be used as a basis for evaluating many kinds of school task.

The SOLO Taxonomy - General Principles

Most content areas have tasks which are well suited to the kind of structural analysis which we propose to outline in this paper. Basically, all that is required is a task where a specific, finite set of information is given and, on the basis of prior learning, the student has to answer comprehensive questions showing how well he or she has understood the data, their inter-relationships, and their possible relevance to other concepts. One would expect that under ideal conditions (e.g. one-to-one testing, high motivation) the structure of the observed learning outcome (which for convenience we shall call SOLO) given by a student, would be equivalent to his or her stage of cognitive development. Often, however, the SOLO is far below the expected level. (Collis and Biggs, 1979)

The relationship between the student's stage of cognitive development, and the corresponding SOLO level for any given task, may be understood by the analogy of the relationship between IQ and attainment in any particular subject. IQ refers to a characteristic of the student that generalises across many tasks; it

is relatively stable and is (effectively) independent of instruction. Attainment refers to the result a student obtains in a particular test about quite circumscribed learning material; the attainment score will vary considerably from occasion to occasion and from subject to subject, depending upon the amount and quality of instruction, particular interest in the subject in question and so on.

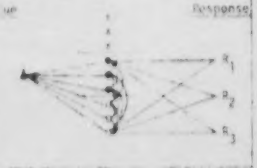
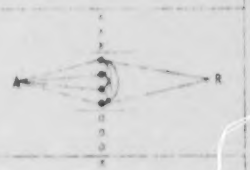
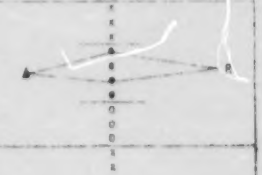
Similarly, a student's stage of cognitive development describes a relatively stable characteristic. In this context students may be described as formal reasoners, pre-operational reasoners, and so on. However, it does not make sense to classify a student as an "extended abstract" or a "pre-structural" reasoner, in just the same way as it does not make sense to refer to a student as "a nine-out-of-tenner" or "a twenty percenter". Such terms refer to an immediate and particular test result, which is what a SOLO response is.

This distinction, between describing responses as opposed to people, is important, because teachers who know their Piaget often find it difficult to understand why a child, who "should" be formal operational on the basis of age or performance in some tasks, appears to be concrete operational in English, or even pre-operational in mathematics. It is because of the possibility of this kind of confusion between general stages of development and particular test results that we have introduced our own terminology; the SOLO terminology implies a warning not to over-generalise. For example, a "uni-structural" response is just that - a response that contains one relevant concept, dimension or datum, out of all those the student could have utilised.

The relationship between cognitive development and SOLO, and the general characteristics of the latter, are outlined in Table 1 below. At the extreme left is given the development base stage, in

TABLE 1

Basic stage of Cognitive Development and Response Description

Development Stage with Normal Age	SOLO Description	1 Capacity	2 Relating Operation	3 Consistency and Closure	Cue / Response
Formal Operations (15+ years)	Extended Abstract	Maximal: Cue + relevant data + inter-relations + hypotheses	Deduction and induction. Can generalize to situations not experienced	Inconsistencies resolved. No felt need to give closed decisions - conclusions held open, or qualified to allow logically possible alternatives. (R_1, R_2 or R_3)	
Concrete Generalization (13 - 15 years)	Multi-structural	High: cue + relevant data + inter-relations	Induction. Can generalize within given or experienced context using related aspects	No inconsistency within the given system, but since closure is unique to inconsistencies may occur when he goes outside the system	
Middle Concrete (10 - 12 years)	Multi-structural	Medium: cue + isolated relevant data	Can "generalize" only in term of a few limited and independent aspects	Although has a feeling for consistency can be inconsistent because closes too soon on basis of isolated fixations on data, and so can come to different conclusions with same data	
Early Concrete (7 - 9 years)	Uni-structural	Low: cue + one relevant datum	Can "generalize" only in terms of one aspect	No felt need for consistency, thus, closes too quickly, jumps to conclusions on one aspect, and so can be very inconsistent	
Pre-operational (4 - 6 years)	Pre-structural	Minimal: cue and response confused	Denial, tautology, transduction. Bound to specifics	No felt need for consistency. Closes without even seeing the problem	

(* = irrelevant or inappropriate; • = related and given or implied)

Piagetian terms, with the minimal age level at which the stage usually occurs. Next follows the name we have given to the SOLO level of response that is isomorphic with, but not identical to, the corresponding

developmental stage, and the following columns marked 1 to 4 describe the characteristics of each SOLO level.

1. Capacity refers to the availability of "mind-space", or more technically, working memory, that the different levels of SOLO require prima facie. Functional working memory capacity increases with age, as does the space required for higher level responses.*

A quick glance at column 4 will show that the student giving an extended abstract response has to keep many things in mind, while the student giving a pre-structural response has only to remember the question itself. A pre-structural response makes least demands: one "bit", the cue (i.e. the question) and response are confused into one global undifferentiated unit. The simplest "correct" (or logically valid) response (termed uni-structural) requires separation between the cue and one relevant aspect to form the response, hence the capacity required is that which enables the handling of two "bits" (cue + one relevant datum). A multi-structural response involves two or more concepts or data: a relational response goes further and inter-relates the concepts, so that in this case we have the cue + most or all relevant data + their inter-relationships. The extended abstract response is on a much higher plane. To give a response at this level the student needs not only to encode the given information, but to comprehend its relevance to over-riding abstract principles. The consequent processing involves deducing hypotheses and applying them to the data both given and implied.

2. Relating operation refers to the way in which the cue, and the aspects of the response, relate together. In the case of the pre-structural response there is no logical inter-relation; the cue and response tend to be fused into one tangled unit. Induction involves correctly drawing a general conclusion from particular instances; or in the present context, relating a particular aspect or point given in the data to a conclusion. A uni-structural response, then, involves ascribing the "answer" to just one of the several relevant features that are in the given data. A multi-structural response faithfully marshalls several of the relevant features, but fails to link them up. The multi-structural response typically contains "...and...and...and...". The relational response gives an overall concept or principle that accounts for the various isolated data that the multi-structural response contains, but sticks within the domain of the data and concepts given.

The extended abstract response goes beyond induction on the basis of the data and introduces true logical deduction. There are several features of the extended abstract response that should be noted at this point: (i) the introduction of an abstract principle not given directly in the data; (ii) deduction from that principle that certain events follow; (iii) the possible introduction of an analogy which is compatible with the principle but likewise not given in the data; and (iv) the possibility that the outcome may be indeterminate, i.e. there is an absence of closure.

3. Consistency and closure refers to two opposing needs felt by the learner: one is the need to come to a conclusion of some kind (to close); the other is to make consistent conclusions so that there is no contradiction either between the conclusion and the data, or between different possible conclusions. The greater the felt need to come to a quick decision the less information will be utilised, so that the probability that the outcome will be inconsistent from occasion to occasion, is increased. On the other hand, a high

* Whether working memory actually increases with age, or whether increasing capacity is a function of the automaticity of the response within fixed working memory, is a debatable issue. McLaughlin (1963) and Pascual Leone (1972), for instance, believe that the capacity of working memory increases with age up to adolescence. Case (1979), on the other hand, believes that working memory is constant across ages, but that with increasing experience, certain data become automated thereby taking up less space within fixed capacity, thus leaving more space for higher level responses. The evidence so far probably favours Case's position but it would be inappropriate to go into this here. Certainly, it seems reasonable, and in keeping with all experimental findings to date, to suggest that higher level responses are dependent upon a great deal of experience at the preceding level.

level of need for consistency ensures the utilisation of more information in making a decision, and the decision is likely to be more open.

The pre-structural response is marked by very high closure and very low consistency: in fact, the student at this level closes by simply saying "I dunno", repeating the question, or by transducing across some irrelevancy. The student who gives a uni-structural response seizes upon the first relevant dimension that comes to mind but at least it is relevant. Uni-structural responses can all be equally correct, but quite inconsistent with each other, rather like the blind men describing the elephant: the elephant was described as a piece of rope, a wall, a snake, a tree trunk, all "correctly" given the perspective of each man.

In multi-structural responses, closure is determined when more aspects are perceived, but as these aspects are not inter-related, inconsistency may result.

The student responding relationally waits until all the aspects are seen and then inter-relates them to make a coherent whole, but still comes up with a definite answer (closure). The major weakness is that while this might be an excellent answer for the given context, it may not be for other, even similar, contexts - i.e. an over-generalization may be made. The relational response is still tied to concrete experience: it leaves room for inconsistency <u>across</u> contexts. The extended abstract response, on the other hand, sets out principles and heavily qualifies their application to a particular situation, i.e. consistency is maximal, and, as a result, the student may feel it appropriate to leave the question relatively open.

4. <u>Structure</u> is an attempt to represent these characteristics in diagrammatic form. The student may respond to the cue by using three types of data: (i) irrelevant data (represented by <u>x</u>); (ii) related data which are contained in the original display, e.g. lesson, prior information (represented by •); and (iii) data and principles which are not given but which are relevant, hypothetical and often implicit in the data (represented by o).

At the pre-structural level there may be an attempt to link the cue with the response by an irrelevant feature. The uni-structural response takes one relevant datum of feature to link the cue and response; the multi-structural response takes several. The relational response ties up the relevant data in a conceptual scheme. The extended abstract response takes up all the relevant data and their interrelations and subsumes them under a hypothetical abstract structure which can enable deductions to apply to instances or data which weren't included in the original display. Consequently, the student giving an extended abstract response can entertain alternative outcomes and is thus not forced to come to a definite closure or conclusion.

The SOLO Taxonomy - Specific Examples

So far we have discussed the general characteristics of the taxonomy. It is now appropriate to put flesh on the bones by taking examples from quite, on the face of it, disparate areas.* Before doing so however, we need to say a few words about the aims of teaching academic subjects. This is a very big subject and needs a paper of its own to do it justice. Nevertheless some brief outline of the authors' views needs to be included at this stage in order to fit this paper into its proper context.

It appears to us that academic subjects are taught with two main effects on the student in mind:

* We say, "on the face of it", because we are coming more and more to the view that, when one is considering a <u>response</u> model such as SOLO, the disparities are more apparent than real.

the assimilation and understanding of the content of the subject (i.e. the facts and concepts that constitute knowledge of the subject); and the cognitive processes that are induced by a proper understanding and application of the subject (i.e. the skills and strategies that constitute the appropriate way of thinking for that subject), both have, presumably, a significant influence on the general cognitive development of the individual - but this is not the place to go into the details of this aspect. We may thus refer to the content and process aspects of learning a subject matter (Biggs, 1979). Both are addressed in the school curriculum, although traditionally content aspects have been accorded more explicit weight in most subjects.

These ideas are not new. Bruner (1960) strongly emphasized the interplay of content and process features in the overall structure of a subject matter. He spoke of the "generic codes" of a subject. These are the basic process and content structures that make the subject. Understanding or assimilation of these codes can be partial, and increases from year to year with both experience and cognitive maturity: hence the notion of the "spiral curriculum", according to which a topic is successively re-addressed, at a deeper level of understanding each time. This is relevant here because the SOLO Taxonomy provides a measure of the quality of assimilation in terms of progressive structural complexity. Ultimately, a true understanding of a subject would involve SOLOs at the extended abstract level in the basic generic codes of the subject.

The kinds of things that might be defined in such a generic code analysis for the two content areas with which this paper is involved might include:

History: sequencing events in time, attributing causes, making value judgments, resolving conflicting reports of an event;

Mathematics: mathematical operations, variable, systems.

For the purpose of this paper we have selected two examples, one from history where the task is to reconcile conflicting evidence from different sources and one from elementary mathematics involving the four operations of arithmetic with whole numbers.

History - Reconciling Conflicting Evidence from Different Sources

Frequently an historian needs to decide between two conflicting sources of data. The manner in which the conflict is resolved is crucial for determining SOLO level. Such resolution may be achieved by:

1. Pre-structural: avoiding the question (denial); repeating the question (tautology); a firm closure based on transduction.

2. Uni-structural: selecting only one relevant datum.

2A:* selecting two data which are inconsistent; no conclusion is reached.

3. Multi-structural: selecting several consistent data, ignoring or discounting the evidence that is inconsistent with the conclusion.

3A:* recognizing the inconsistent evidence or data but being able to resolve them.

4. Relational: accepting most or all of the given evidence, and using a given or implied relationship to reconcile the conflict.

4A:* a hint that closure is not inevitable; that the relating principle might itself be relative to context but this is not made explicit.

5. Extended Abstract: reconciliation of conflict by appeal to more universal principles; appeal to data

* Transitional Responses It is sometimes found that responses do not fit exactly into the five levels described earlier. Transitional responses can occur when the student is feeling for the next level, but does not quite make it: transitional responses tend to be marked by confusion or inconsistency. It is as if the student is handling more information than is usual in the level the student is emerging from, but he or she is forced to give up before reaching the complexity of structure that is expected at the next SOLO level. Because of this confusion or inability to reach closure, a well-formulated transitional response at a lower level can be mistaken for an extended abstract response, which likewise may not reach closure but for a very different reason.

and to principles that are not given; conclusion usually held open.

Year 11 and 12 students completed the following item:

"Below are two views of the conditions in Britain in the 1830's. Read them both and then answer the question.

1. The working classes in Britain, though they have their grievances and distresses are, on the whole, better off as to physical comforts than any other European working class. They have a more plentiful supply of food, better clothing, and better furniture and for this reason suffering is more acutely felt. Yet we firmly believe that, in spite of heavy taxation, a war, and a huge public debt, the country is becoming richer and richer.

2. Factory workers are working from 3.00 a.m. until 10.00 p.m. for three shillings and seven pence halfpenny, a quarter of which they lose if they arrive five minutes late for work. Children of six years old are working in these factories under the most atrocious conditions. The overlookers often beat their workers but no compensation is paid for injuries received at work.

The workers' houses consist of one room with an earthen floor. These houses are packed tightly together around the factory and this together with the lack of proper sanitation make for very unhealthy, in fact, dangerous conditions."

Question: Do you think the British worker was well off?

Examples of Responses

1. Pre-structural

(a) "No."

(b) "Of course not. In that time it was the highlight time of capitalism in England."

The second response is an emotional irrelevancy: the respondent (who was a mature student with a "political" background) might have had a point if he had elaborated but he has merely used a slogan, not an argument.

2. Uni-structural

(a) "The British worker was not well off because of their appalling working and living conditions."

(b) 'In comparison to the workers across Europe they were well off. I would not like to see the conditions across Europe."

In each of these passages, the students have responded to only one feature: appalling working and living conditions (these are seen as one total aspect of life rather than as two separate aspects), and comparison with European conditions.

2A. (a) "I don't know. The two articles contradict each other. One describes the working class to be better off and the other seems to issue complaints. 'Day in the Life' of a factory worker, their unhealthy living conditions, etc. The British worker depending on what job he actually did could accurately describe his working conditions."

(b) "If the workers in Britain are much better off than in any other country then they must be quite well off, but working so hard and in such terrible conditions not many people would want to do this (the two passages are contradicting this but are showing different points of view), but I must say that not many people would stay healthy in those kinds of conditions these days."

In both the above passages the students have gone beyond a naive unidimensional interpretation: they recognise the conflict but are unable to reconcile the opposing points of view and thus fail to come to any general conclusion.

3. Multi-structural

(a) "I think the average worker was not well off as they worked over 12 hours a day and they would have less time to sleep as they worked the long hours. Their pay was not the best considering how long they had to work. The country may have been becoming richer and richer but the struggle to get there was very hard and tiring."

(b) "No, the British worker was not well off. Although the British workers' conditions may have been better than that of other European workers, this does not prove he was well off. Factory conditions were very bad with long hours and poor wages. The employment of six year old children was outrageous, but of course cheaper, hence decreasing the number of jobs available to the adult worker. This lead to unemployment. The British workers survived in cramped, overcrowded, insanitary conditions; he lived no comfortable life."

In these responses the possibility of an alternative view is not really entertained, and only the evidence for the conclusion is presented. In the second example this "evidence" includes a point, "unem-

ployment", that was in fact not made in the text, but this in itself does not justify an extended abstract classification because the imported term is not deduced from wider principles but is simply a reasonable association (particularly salient at the time of writing).

3A. "No, I do not. The first article would indicate that they were fairly well off and this is the reason that they felt small sufferings. However, the evidence of the second passage indicates the traumas that the average worker at this time faced. It could not be true that these conditions could be good, or that this could be well off."

3A responses were rare; the above being the only possible example. The student has a firm conclusion, recognises the contrary case, but dismisses it rather than counteracts it as would have been done in a 4 response. However, there are hints here of relational thinking, even of extended abstract (the last sentence is hinting at a definition of "well off"), but these are not developed.

4. Relational

(a) "No, I think their conditions were degrading and appalling. If the British were better off than the Europeans I would have hated to see the Europeans. The first article seems to give an unrealistic propagandistic statement concealing the true facts. 'In spite of taxation, a war, a huge public debt, the country is becoming richer and richer.' - may be the rich are getting richer but the poor weren't. The first article compares the conditions to an indefinite quantity (that is, the European working class) whereas the second gives the true sounding (at least) facts."

(b) "No, the first one contradicts the second one. The first one seems to have beeen written by someone in government or who owns a factory and has to pay the workers. He is therefore trying to convince himself and therefore others that the working conditions are reasonable. The second and third paragraphs, however, tell quite a different story; the people have to struggle hard to earn their wages."

In both the above responses, a student has attempted to come to a definite but balanced conclusion by appealing to an explanation that reconciles all the data. The explanation is not however in terms of an abstract principle that might point to the relativity of the data.

4A. (a) "Compared to modern day conditions the British worker did not appear to be well off. Maybe at the time British conditions were superior to those in Europe but even regarding this the living conditions were pitiful. With child labour also common practice and heavy penalties for misdoings life would have been unrewarding. The two passages are very contradictory and it is hard to gain a full impression."

(b) "I think that the British workers had to go through some suffering to eventually show some improvement. The fact that whether the second view of conditions was the worst ever written on the conditions of the British working class during the time. Maybe there were only one or two factories where conditions were such, or maybe factories everywhere suffered these conditions."

In response (a) the student appears to have come to a considered but firm 4-type conclusion - but then she notes the contradiction and hedges her bets but without attempting to appeal to a principle to reconcile the contradiction. In response (b) the student has raised a very important point, not given in the data themselves, about the generality of the points made: hence she is not able to come to firm closure. This response is arguably extended abstract, but is classified as 4A because it lacks a clear appeal to principle.

5. Extended Abstract

(a) "No, the British worker was not well off. Conditions may have been better for the country than they were once, but they were still not of a satisfactory standard as far as human conditions are concerned. The country was being made richer at the expense of human suffering. The first view gives the impression that working class should be happy because their conditions were better than the average Europeans but using comparisons often gives a distorted view: A man dying of cancer is by comparison better than one dead I suppose; but his condition leaves much to be desired! The suggestion that the English working man suffers more because he is better off is also wrong. Wanting improved conditions was a sign that the English worker was on step 1 to achieving them. The people had to realise their need first. This awareness of their poor life was a good sign.

The difference between the two views is probably due to the writer's position. One was most likely a judge or high-class person, the other someone in direct contact with the worker, someone who could see the worker was not well off.

(b) "No, I don't feel the British worker was well off. I am a student in the 1970's, living in a technologically advanced age and I feel through my studies of History that these people were extremely ill-treated. I conclude this through my emotions and comparison of then to now. The children were given no chance of education, they suffered bodily harm. If the question stated whether the British workers were better off than the Europeans then maybe my answer would be yes. But the question merely states were the British workers well off, and I feel there is no other answer than no."

In response (a) the student accounts for the contradictions and his conclusions in terms of super-ordinate principles that are not given in the data. "The country was being made richer at the expense of human suffering"; "using comparisons often gives a distorted view"; the analogy following (which admittedly is not very good) and the reference to "the writer's position".

Several points should be noted about response (b): (i) Despite the admission of emotion, this student is very "cool": she stands apart from her judgment and can admit the emotion and explain its source. (ii) Likewise, she is aware of her perspective: she is making a detached (although deeply felt) judgment across time and culture. (iii) Her closure is relative to the question; she can admit a different closure to a different question and entertain the possibility that other questions could have been asked.

Mathematics - Solving a problem involving the four operations with whole numbers

Responses to elementary mathematical questions highlight the difficulty mentioned earlier; that the "correct" response does not necessarily indicate the complexity of the thought process involved nor the complexity of which the respondent is capable. To find the nature of the structure involved necessitates further probing whether the answer is correct or not. The examples given below assume this further probing.

Students from mid-primary school through to tertiary level can legitimately be asked to respond to the following question: Find the value of "△" in this statement, $(72 \div 36) \times 9 = (72 \times 9) \div (\triangle \times 9)$.

Examples of Responses

1. Pre-structural

(a) "Have not done ones like that before, so I can't do it."

(b) "Don't want to do it."

2. Uni-structural

(a) "36 - because there is no '36' on the other side."

(b) "2 - because $72 \div 36 = 2$."

Both responses take only one part of the data into account. Response (a) shows a low level "pattern completion" strategy; response (b) shows one closure and then an ignoring of the remainder of the item. Both these strategies of course give "correct" responses to certain items.

3. Multi-structural

(a) $2 \times 9 = 18$

$648 \div (\triangle \times 9)$
$648 \div ? = 2$, i.e. 324
looking for 18 (2×9)

Hence 324

This response involves a series of arithmetical closures to reduce the complexity and to focus in on "△". However, the student appears unable to keep the overall relationship in mind throughout the series and ends up getting lost in the "maze" that has been created.

4. Relational

(a) $2 \times 9 = 18$

$648 \div (\triangle \times 9)$
$648 \div 9 = 72$
then $72 \div 4 = 18$

Hence 4

This response also involves a series of arithmetical closures but the student is able to keep the relationships in mind and successfully solves the problem.

5. Extended Abstract

First step involves obtaining an overview of the relationships between the numbers and operations involved, e.g. $(72 \div 36) \times 9 = (72 \times 9) \div (\triangle \times 9)$

The "pattern" suggests something akin to the "distributive" property - this hypothesis is tested out thus: $\frac{a}{b} \times y = \frac{a \times y}{b}$. This immediately solves the problems as follows:

$$(72 \div 36) \times 9$$
$$= (72 \times 9) \div 36$$
$$= (72 \times 9) \div (4 \times 9).$$

Hence 4

This response shows the following characteristics, (i) focussing on the relationships between the operations and the numbers rather than regarding the operations as instructions to close; (ii) testing an hypothesis implicit in the data; and (iii) avoiding closures wherever possible.

Conclusion

The educational implications of the response model described above, fall into three inter-related categories, curriculum, evaluation and teaching method. Obviously space will not permit us to go into detail in this paper but, equally obviously some brief mention needs to be made of them in order to round off the discussion.

In the curriculum area we see this approach as assisting in, (i) analysing the broad curriculum into generic tasks which need to be understood at certain prescribed levels if the curriculum is to be considered to be taught satisfactorily; (ii) identifying, within the generic tasks, particular tasks which illustrate essential content or processes; and (iii) determining instructional objectives set so that both the nature of the task and the level of performance quality are pre-determined.

Evaluation of educational outcomes can be carried out quantitatively or qualitatively. Most teachers would probably argue that the quality of learning is of critical importance and yet the most sophisticated technology in testing is designed for quantitative norm-referenced evaluation. The model proposed here is designed to make clearer to both teacher and student at least one aspect of a quality performance. It is not suggested that SOLO-based gradings completely replace quantitative evaluation - it still remains important to know how much a student has learned - but that we should have, in addition, an index of how well integrated the student's learning is.

In the domain of teaching method several applications of the model stand out immediately. First of all it can materially assist the teacher to adjust the level of exposition to the level at which the student is responding; the structure described gives the teacher a technique whereby a professional judgment can be made as to whether to attempt to raise the level of response or to accept the level given. If the decision taken is to attempt to raise the level the model provides some hints as to techniques which might be used. Finally it provides the teacher with a tool for analysing and clarifying in practice the meanings which need to be attached to instructional concepts such as concrete vs. abstract, the importance of a student's prior knowledge and motivation.

References

Biggs, J.B. "The Relationship between Developmental Level and the Quality of School Learning" in Modgil, S. and Modgil, C. (Eds.) Toward a History of Psychological Development within the Piagetian Framework. Slough: N.F.E.R., 1979.

Bruner, J.G. The Process of Education. Cambridge, Mass.: Harvard University Press, 1960.

Case, Robbie. "The Underlying Mechanism of Intellectual Development" in Biggs, J. and Kirby, J. (Eds.) Instructional Processes and Individual Differences in Learning. N.Y. : Academic Press, 1979.

Collis, K.F. and Biggs, J.B. Classroom Examples of Cognitive Development Phenomena: The SOLO Taxonomy; A report printed at the University of Tasmania, November, 1979.

McLaughlin, G.H. "Psycho-logic: a possible alternative to Piaget's formulation." B.J.E.P., 1969, 33, 61-67.

Pascual-Leone, J. Cognitive Development and Cognitive Style. Boston: Heath (Lexington Books), 1972.

STUDENT PERCEPTIONS OF THE SECONDARY SCHOOL : A CASE STUDY

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OBJECTIVES AND CONCEPTUAL FRAMEWORK

This paper reports a study carried out in 1979 in a state secondary school in Sydney code named Metropolitan High School. The objective of the study was to explore the perceptions of school of students from Years 8 to 12 inclusive, at three times in the one school year. Data were collected by means of a questionnaire entitled School Climate Index. This was originally developed in the United Kingdom by Finlayson, Banks and Loughran (1971) and adapted for use in New South Wales schools by Deer (1977; 1980).

The School Climate Index consists of two 11 item scales. The Teacher and Peer Concern for Students scale indicates the degree to which students perceive

a) their teachers as being sensitive to the individual needs of students and

b) their peers deriving social and emotional satisfaction from participation in school activities.

A high score on this scale indicates concern. The other scale, Teacher and Peer Control of Students, indicates the degree to which students perceive their peers

a) to have accepted the tasks they are set by the school, and

b) to be applying themselves to those tasks and the degree to which teachers

i) impose their expectations on students, and

ii) are required to exercise power in an attempt to secure compliance.

On this scale a high score indicates a positive orientation with democratic control.

Many studies have been conducted on organisational climate both within schools and in other organisations (see Deer: 1977 and Finlayson and Deer: 1979). However, very few explore the stability of perceptions by collecting data from the one organisation at several time periods.

One study by Greiner, Leitch and Barnes examined organisational climate over a period of three years in eight district offices of the Internal Revenue Service in the U.S.A. They concluded:

> ..... the common theme of our findings is the remarkable uniformity of organisational climate across eight Internal Revenue Districts in our study. This uniformity persisted for three years and it included not only the dominant climates of the districts but also their back-up and sub-climates as well. (1968: 218)

In this study, back-up climates are described as being generated over the years in an organisation because adherence to a single dominant climate is likely to prove impossible for guiding the behaviour of all people in the organisation in all situations. Sub-climates were identified as a result of the finding that not all employees perceive all parts of the overall climate in the same way (see Greiner et al., 1968: 207,210).

No studies are known that explore student perceptions of the school over a period of time. In a school, there is a regularly changing population of students, a population that is maturing. However, it may be that like the study by Greiner and his associates the overall perceptions vary little. Knowledge of such perceptions considered by year level, ability level and sex would provide a basis for staff intervention should this be desired.

METHODOLOGY

In this study data were collected on three occasions from students, namely at the end of February, May and September corresponding to the first part of each of the three terms. The results reported here are only for those students who were present at each of the three data collections. There is thus a final sample of 181 students from Years 8 to 12 inclusive, although numbers completing the questionnaires were as follows:

February - 246
May - 227
September - 232

If students were absent on the day the questionnaire was administered to their class, no attempt was made to allow them to complete it on another day. Other causes for the reduction in the sample arose as a result of new arrivals to the school and departures from it, either with the family moving or the student leaving to get a job.

For the sake of administrative convenience for the school, the students came from classes taken from the Social Science Department groupings. There were three classes from each of Years 8 and 10, and two classes from each of Years 9, 11, and 12. Year 7 students were not included as the questionnaire had not been designed for students with such limited experience of high school life.

Originally it had been planned to have a high, a medium, and a low ability level class in each of Years 8 to 12 inclusive. However, such classes were only available within Years 8 and 10 in the Social Science Department. In the other three years, the two classes represented were classified as a high and a low ability class. Discussion with Social Science staff during the administration of the questionnaires indicated the doubtful nature of this latter classification.

Tables 1, 2, and 3 show the details of the sample used in this paper.

TABLE 1 : THE SAMPLE BY YEAR AND SEX

YEAR	FEMALE	MALE	TOTAL
8	30	25	55
9	15	21	36
10	30	20	50
11	2	11	13
12	17	10	27
Total	94	87	181

Throughout 1979, there were more girls than boys in Metropolitan High School, so the sample is similar to the school population. However, in September in Year 10 there were 79 girls to 82 boys, while in Year 11 only 30 girls compared with 39 boys. The imbalance in the sample in Year 11 is therefore reflective of the Year as a whole.

TABLE 2 : THE SAMPLE BY YEAR AND ABILITY LEVEL

YEAR	ABILITY LEVELS			TOTAL
	HIGH	MEDIUM	LOW	
8	25	23	7	55
9	24	-	12	36
10	23	19	8	50
11	6	-	7	13
12	15	-	12	27
Total	93	42	46	181

Table 2 indicates that more than half the sample can be classified as high ability level.

TABLE 3 : RELATIONSHIP OF SAMPLE POPULATION TO YEAR/SCHOOL

SAMPLE	YEAR					TOTAL
	8	9	10	11	12	
Number of Respondents	55	36	50	13	27	181
Number of Respondents as percentage of sample population	30.4	19.9	27.6	7.2	14.9	100.0
Number of Respondents per Year/School, September 1979	145	132	161	69	75	582
Number of Respondents per Year/School September 1979	37.9	27.3	31.1	18.8	36.0	31.1

From Table 3 it can be seen that the sample represents almost one-third of the school population from Years 8 to 12 inclusive. Furthermore, with the exception of Year 11, the sample represents at least 25 per cent of the students in each year. The small number of students included in the sample in Year 11 was due to the small number in that year in 1979 taking Social Science subjects.

The questionnaires were administered by the author or her assistant during one of the regular Social Science lessons. In February all questionnaires were given by the author, and in September by the research assistant. In May, choice of administrator was on the basis of scheduling convenience. Between 20 and 30 minutes were required to complete the questionnaires, which included a number of items on student background in addition to those relating to the two scales.

ANALYSES AND RESULTS

Data were analysed as a multivariate analysis of variance (Finn: 1972, and Finn and Mattsson: 1974). The two scales, Teacher and Peer Concern for Students, hereafter referred to as Concern, and Teacher and Peer Control of Students, hereafter referred to as Control, were the dependent variables. As recommended by Hummel and Sligo (1971: 56), univariate analyses of variance were only examined where the multivariate analyses of variance were statistically significant. Hummel and Sligo further recommend this approach for its consistency and limited conservatism.

Table 4 reports only statistically significant results of the multivariate analysis of variance. It indicates significant year, ability level and month main effects and a significant year by ability level interaction.

TABLE 4* : MULTIVARIATE ANALYSIS OF VARIANCE

	INDEPENDENT VARIABLE	F RATIO	DEGREES OF FREEDOM	PROBABILITY
a) Main Effects :	Year	7.15	8,314	< .0001
	Ability Level	4.21	4,314	.003
	Month	2.71	4,157	.03
b) Interaction :	Year x Ability Level	3.75	10,314	< .0001

Note: The analysis used was a hierarchical one in which the order of the effects in the analysis is the order of the main effects listed in Table 4.

Table 5 reports univariate results where the multivariate analysis of variance was significant.

* An inspection of the data revealed that the variance-covariance matrix was not equal across the levels of the month of testing factor. This violation of an assumption of repeated measures analysis of variance forced the analysis to proceed via a design on the dependent variables. (Finn & Mattsson, 1974).

TABLE 5 : UNIVARIATE ANALYSIS OF VARIANCE

SOURCE	MEAN SQUARE	F RATIO	DEGREES OF FREEDOM	PROBABILITY
a) Main Effects				
Year				
Concern	915.60	4.31	4,158	.003
Control	3724.34	14.21		< .0001
Ability Level				
Concern	620.83	2.92	2,158	NS
Control	1328.32	5.07		.007
b) Interaction				
Year x Ability Level				
Concern	807.75	3.81	5,158	.003
Control	1866.06	7.12		< .0001

TABLE 6 : SCALE MEANS BY YEAR

YEAR	SCALE		NUMBER
	CONCERN	CONTROL	
8	33.19	33.91	55
9	30.65	30.27	36
10	33.87	35.50	50
11	35.00	36.50	13
12	35.30	39.10	27
Total	33.32	34.00	181

Each item in each scale was scored on a five point scale from strongly agree to strongly disagree. The low score range is from 11-25; the medium score range from 26-40; and the high score range from 41-55. It will be noted that all means fall within the medium range. However, as Tables 4 and 5 indicate, there are statistically significant year differences with students in Years 11 and 12 perceiving the school in a more favourable way than those in the junior school.

The tests for trend across years, using orthogonal polynomial contrasts, revealed that both concern and control are linearly related to year. The sharp drop in concern and control means in Year 9 also led to a significant cubic component in the tests for trend. None of the other polynomial contrasts was statistically significant. The significant data are reported in Table 7.

TABLE 7 : TREND ACROSS YEARS

	F RATIO	DEGREES OF FREEDOM	PROBABILITY
a) MULTIVARIATE ANALYSIS OF VARIANCE			
Year - Linear Trend	23.26	2,157	< .0001
Year - Cubic Trend	4.46	2,157	.01
b) UNIVARIATE ANALYSIS OF VARIANCE			
Year - Linear Trend			
Concern	6.98	1,158	.009
Control	46.10		< .0001
Year - Cubic Trend			
Concern	7.12	1,158	.009
Control	6.30		.01

Table 8 reports the mean scale scores for ability levels in the sample.

TABLE 8 : SCALE MEANS BY ABILITY LEVEL

ABILITY LEVEL	SCALE		NUMBER
	CONCERN	CONTROL	
High	32.99	34.80	93
Medium	34.80	33.60	42
Low	32.97	32.71	46
Total	33.32	34.00	181

One might expect that higher ability students would perceive their school more favourably than lower ability students. This is the case here for the scale relating to how control is exercised in the school. Only Years 8 and 10 have students classified as of medium ability, and Table 9 shows the importance of the Year 8 students in producing the mean for the concern scale in Table 6.

Although ability level produces a significant overall main effect this is not true for all year levels - and Table 9 shows where these differences occur.

TABLE 9 : SCALE MEANS BY YEAR AND ABILITY LEVEL

YEAR AND ABILITY LEVEL	SCALE		NUMBER
	CONCERN	CONTROL	
Year 8			
High	31.73	31.94	25
Medium	35.80	33.40	23
Low	29.85	26.90	7
Year 9			
High	29.58	29.66	24
Low	32.77	31.50	12
Year 10			
High	35.53	39.70	23
Medium	33.50	33.80	19
Low	29.86	27.42	8
Year 11			
High	36.70	39.66	6
Low	33.46	34.36	7
Year 12			
High	35.10	38.56	15
Low	35.50	39.86	12

In view of the comments about Year 9 students raised by Tables 6 and 7, it is interesting to note in Table 9 that it is the higher ability group in that year which has the lowest mean scores.

TABLE 10 : SCALE MEANS BY SEX

SEX	SCALE		NUMBER
	CONCERN	CONTROL	
Female	33.60	34.30	94
Male	33.02	33.06	87
Total	33.32	34.00	181

Although no statistically significant differences were recorded when students were grouped by sex, Table 10 is included to show the group means.

TABLE 11 : SCALE MEANS BY YEAR AND MONTH

YEAR AND MONTH	SCALE		NUMBER
	CONCERN	CONTROL	
Year 8			55
February	34.18	32.75	
May	32.53	30.95	
September	32.87	32.05	
Year 9			36
February	31.89	30.58	
May	30.31	29.61	
September	29.75	30.64	
Year 10			50
February	33.46	35.74	
May	34.36	35.10	
September	33.82	35.72	
Year 11			13
February	34.00	37.38	
May	36.15	36.69	
September	34.85	36.38	
Year 12			27
February	35.56	40.15	
May	34.41	38.85	
September	35.93	38.44	
Years 8 to 12 inclusive			181
February	33.72	34.58	
May	33.13	33.42	
September	33.11	34.05	

While Table 11 shows variations by month for individual year groups, it is remarkable for the overall consistency in means for <u>all</u> students across the three time periods.

DISCUSSION

The findings show that year level has the most important effect on student perceptions of the school as measured by the concern and control scales. In particular, students in the junior school, especially Year 9, have the least favourable perceptions. Older students perceive the teachers and their peers showing them more concern and exercising control in a more positive and democratic way. Such a finding confirms one's "hunches" and emphasises the maturation changes of adolescents. Table 9 shows the low means on both scales for Year 9 students.

For each scale the special position of the Year 9 means should be recognised. The noticeable dip for this year is indicative of the "nobody loves me" syndrome, common to many adolescents. In Year 9, students are not faced with a major examination, have settled into high school life, and many reach the legal age for leaving school. The results reported in Table 6 show them in need of extra attention by the staff in comparison with students from other years in the school. Some are questioning the relevance of schooling and others whether the continuation of schooling is worthwhile for future employment prospects.

Ability level also affects student perceptions of the school. However, it is not as clear cut as might be expected. It is not always the higher ability students who have the most favourable perceptions. This is only true for students in Years 10 and 11 in this sample.

This study is also notable in that there were not multivariate statistically significant results in perceptions when students were grouped according to sex. In view of recent discussions regarding sexism in schools, this is an important finding.

Data reported by Deer (1977) included Year 9 students from the same school used in this study. These data were collected only once in November 1974. However, on both scales the 1979 means for Year 9

are higher than those obtained in 1974. One can only speculate as to the reasons for the upward movement of these means. In the last ten years there have been three principals at this school, but perhaps more importantly, the school enrolment peaked at over 1000 students and has now fallen to just over 700 students. Schumacher's (1973) 'Small is Beautiful' may well apply to schools. A smaller school makes it much more possible for students to be personally known by more of their peers and the staff. Teachers, too, are more likely to know more of the names of the students in their school and to know more of the work of their colleagues in other departments. Given the current organisation of high schools into rather isolated subject departments, often spread out over a large site, declining school enrolments may be a blessing in disguise if they result in greater personal contact among the primary participants in the process of schooling - staff, students and parents. Greater contact is a means of developing a better understanding of the hopes and fears of all parties. However, should there be a concomitant reduction in clerical assistance as the size of the school enrolment declines, many of the potential benefits outlined above will be lost. Teacher time will be required for clerical jobs rather than being available for their students' parents and their colleagues.

Comparison of the 1974 and 1979 means for the Year 9 students shows that it is possible for the perceptions of students to change with changes in the environment. There have been changes at Metropolitan High School. Feedback of data to staff allows them to comment on the results and to act on them if they desire. The results of the 1979 data collections were presented to the staff at staff meetings, together with a copy of the report made after each collection. The comments of the staff at these meetings supported the results obtained.

REFERENCES

Deer, C.E. (1977). The relationship between organisational climate and the interrelationships between the school, the home and the community. Unpublished Ph.D. thesis, Macquarie University.

Deer, C.E. (1980). Measuring organizational climate in secondary schools. Australian Journal of Education 24, 1, 26-43.

Finlayson, D.S., Banks, O. and Loughran, J. (1971). Administrative manual for pupil questionnaire for school climate index. Slough: National Foundation for Educational Research.

Finlayson, D. and Deer, C. (1979). The organizational climate of secondary schools : A cross-cultural comparison. Journal of Educational Administration 17, 2, 128-138.

Finn, J.D. (1972). Multivariance : Univariate and multivariate analyses of variance, covariance and regression. Version V. Ann Arbor, Michigan: National Educational Resources.

Finn, J.D. and Mattsson, I. (1974). Multivariate analysis in educational research. Some applications. Report 7. Unpublished paper prepared for the Institute for the Study of International Problems in Education, Stockholm University.

Griener, L.E., Leitch, D.P. and Barnes, L.B. (1968). The simple complexity of organizational climate in a governmental agency, in Organizational climate : Exploration of a concept. (Eds. Tagiuri, R. and Litwin, G.H.), Boston: Harvard University.

Hummel, T.J. and Sligo, J.R. (1971). Empirical comparison of univariate and multivariate analyses of variance procedures. Psychological Bulletin 76, 1, 49-57.

Schumacher, E.F. (1973). Small is beautiful. Economics as if people mattered. New York: Harper Torch.

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IS THERE LIFE AFTER SCHOOL? A SURVEY

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Background

In 1977 the Research Section of the South Australian Education Department was invited by the Director-General of Education, Mr. John Steinle, to investigate students' reasons for leaving school, their post-school experiences and perceptions of their schooling.

Mr. Steinle expressed interest in whether the more academically able students were tending to take jobs rather than continue with their studies. Further to this, discussions between Research Section staff and students revealed debate as to whether Year 10 leavers stood a better chance of employment than those who completed Year 11 and/or 12.

At this time unemployment rates were rising among young people and were especially high among girls. Some investigation seemed warranted into the educational background, attainments and career aspirations of the employed and the unemployed with particular reference to girls.

Intensive career education programmes were operating in a number of schools and the help of the Research Section was sought in the evaluation of these courses. It seemed likely that comparing school leavers from such schools with schools offering no special facilities would provide useful feedback to career education teachers, student counsellors and teachers generally.

Meanwhile there appeared to be few studies looking at the particular problems experienced by school leavers in 1977. Studies such as 12-20 : Studies of City Youth[1] (Connell et al 1975) and The Luck of the Game[2] (Tinney et al 1974) were completed before unemployment became a serious issue. More recently, local studies such as The Report of the Youth Unemployment Working Party[3] (1976) focussed on the unemployed but gave no picture of the overall situation.

Accordingly we designed a project that would give some insight into all these issues and also give some idea of the way things were going for young people in the fast tightening employment situation.

Basically, the project involved following up school leavers from six metropolitan high schools with a questionnaire and interviews. Three of the schools were chosen as having a variety of intensive career education programs. Each of these schools was paired with a school offering career education counselling of a more traditional kind and located nearby so that employment opportunities were similar. These six schools, whilst not representing a complete cross section, are by no means a homogeneous group and the leavers from them have widely varied backgrounds, both demographically and academically.

Late in 1977 academic potential ratings were obtained on all students in the six schools (Years 10-12) with the intention of making comparisons between leavers and stayers. Matriculation results (1977) were obtained from the Public Examinations Board to compare those who went on to further study with those who elected to seek employment. In 1978 and 1979 we collected names and addresses of those students who left the six schools after October 1977 and prior to October 1978. Altogether, 1,695 school leavers were

involved. These school leavers were surveyed by means of a mail questionnaire after they had been out of school approximately six months.

The questionnaire was developed following discussions with school leavers, students, teachers and student counsellors. Interested groups such as the Department of Further Education, the Youth Work Unit (Department of Labour and Industry), the Service to Youth Council and Job Hunters Clubs were also consulted and contributed to the questionnaire.

After two trial runs the final version was mailed to school leavers in May and throughout 1978. School leavers who did not return questionnaires within 3 weeks were sent a second one. In addition, interviewers from the Australian Bureau of Statistics followed up non-respondents. This increased our returns and also reassured us that there were no great differences between respondents and non-respondents.

Measures and Variables

For a measure of academic potential all students in the six schools were assessed by their teachers. Teachers were asked to classify students into three groups showing whether students seemed capable of pursuing public examination or tertiary courses (group 1), alternative courses (group 2), or whether they should look for work (group 3). This type of assessment was found to correlate more closely with I.Q. in a pilot study at one of the schools than other forms of assessment, e.g. English and Maths scores.

For a measure of socio-economic status we classified the occupations of school leavers and their parents using the 16-point scale developed by Broom and Jones (1969)[4]. This scale was felt to be sufficiently flexible to accommodate both school leavers and their parents in that it attempts to classify occupations in terms of level of skill and reward or prestige.

A closed questionnaire format was used in the actual survey though spaces were left for respondents to write open ended comments. The questionnaire asked for biographical details including parent occupations, leavers' academic background, employment history, reasons for leaving school, likes/dislikes about jobs, job and study aspirations etc. We also sought information on the activities of unemployed leavers and on the future outlook of all our respondents. The data was analysed using sex, school and year of leaving as variables.

Results

The response rate of 86% to our questionnaire greatly exceeded our expectations, and almost all forms were adequately completed. We felt that this was a strong indication of young people's concern over the present employment situation. After weeding out questionnaires that were incomplete, grossly inconsistant with school records or from mature age students we were left with a working total of 1,224 respondents.

More than half our respondents were in full-time work at the time they received their questionnaires, and a quarter were unemployed. Others had undertaken full-time study, and a few (3%) were in part-time work.

Socio-Economic Status

In South Australia the majority of people leave school after Year 11, the fourth year of high school. Those who leave before are regarded as early leavers. Those who continue with Year 12 either pursue courses* leading to a public examination - matriculation or pursue alternative courses offered by their schools. We were able to observe the effect of socio-economic status on school retention rates among our respondents.

Low socio-economic status appeared to be related to early leaving and also to unemployment. Those of our leavers who went into Year 12 and on to further study particularly were of relatively higher S.E.S. The group who left school before the end of Year 10 had a mean S.E.S. score on the Broom Jones scale of 10.6 whereas the group that pursued P.E.B./Matriculation courses had a mean score of 7.6. (N.B. on the Broom Jones scale the lower the score the higher the S.E.S. ranking). Similarly, the group of respondents that went on to further study had a mean score of 7.7, the employed group 8.8 and the unemployed 9.6.

Braindrain and Academic Potential

We had obtained academic assessments on the 3 point lo-hi scale described above. It appeared that very few students placed in the high ability group actually left school. Some 3% of those left before Year 11 and only 15% left in the main exodus at the end of Year 11.

On the other hand people from the low ability group (those teachers thought should look for work) did not leave either. Only 20% of such students left at Year 10 and the pattern was similar at Year 11. Thus most students leaving school were from the middle ability group and it did not appear that many of the "good" students were leaving in the tightening job situation. Our impression was rather that the less able students were drifting on at school and into Year 12 particularly because suitable jobs could not be found. And indeed outcomes were poor for those assessed as less academically able and they tended to preponderate among the unemployed.

Of the matriculants the majority (60%) went on to tertiary study. Thirty percent went to work mainly in lower professional or clerical positions and 10% were unemployed.

We found little or no difference in the matriculation standard of those who went on to further study at Colleges of Advanced Education and those who obtained jobs.

Virtually all those who were engaged in full-time study felt that they were enhancing their job prospects. Nevertheless, this group was more generally pessimistic about the future even than the unemployed groups. Only 59% said it would be 'better than now' compared with 71% of unemployed leavers. This, combined with the fact that 44% of them said they would take an interesting job if available adds to the impression that they too were 'drifting' on with education because acceptable jobs were not available.

* hereafter referred to as P.E.B. courses

Year of Leaving

Those students who left school at the end of Year 11 were the most successful group in obtaining employment. Those respondents who left before attaining Year 11 status had a very high rate of unemployment. However, those who left at the end of Year 12 and had not attempted matriculation also had a high rate of unemployment and this pattern was consistent across the project schools.

Completion of Year 11 appeared to be critical - those who stayed on at school for part of Year 11 appeared no more likely to get a job than those who left at the end of Year 10, and those who left during the course of Year 12 were no more successful than end of Year 11 leavers.

Table 1 shows the employment rates for each level. Full-time students have been excluded because they have, as it were, removed themselves from the job market.

Table 1 : Destination of school leavers by educational attainment

	Mid Year 10	End Year 10	Mid Year 11	End Year 11	Mid Year 12	Non Matric.	Matric.
Full-time work	54%	63%	60%	78%	72%	58%	73%
Part-time work	6%	3%	4%	2%	4%	7%	4%
Unemployed	39%	34%	36%	20%	24%	34%	23%
Total number	79	91	171	260	92	184	108

Table 2 gives an idea of the jobs held by our respondents. Predictably, early leavers had the lower status jobs.

Table 2 : Full-time jobs held by educational attainment

	Mid Year 10	End Year 10	Mid Year 11	End Year 11	Mid Year 12	Non-Matric.	Matric.	Total Group
Lower professional	-	2%	2%	2%	3%	16%	16%	6%
Clerical	3%	11%	20%	28%	31%	39%	61%	30%
Armed forces	3%	-	-	3%	5%	3%	4%	3%
Trades	13%	30%	17%	29%	15%	10%	7%	19%
Shop assistant	20%	19%	23%	14%	19%	15%	3%	16%
Service work	20%	14%	13%	8%	15%	4%	5%	10%
Unskilled	40%	21%	25%	17%	11%	12%	5%	17%
Total number	40	57	103	200	65	103	77	648

It would seem that Year 11 leavers had achieved the most appropriate combination of job aspirations, academic achievement for their age. Year 12 leavers were older (and therefore more expensive to hire). Their aspirations were higher maybe because of their 'extra' year, maybe because of their S.E.S. Certainly more than half of unemployed Year 12 leavers were looking for white collar jobs.

To add to the difficulties experienced by Year 12 leavers it seems likely that employees were using the matriculation as a criterion for selecting job applicants. Even those who failed matriculation

had a higher employment rate than those who did not attempt it. Thus 62% of failed matriculants gained employment compared with 54% of those who pursued non-P.E.B. courses.

Sex Differences

Our group of respondents contained almost equal numbers of males and females. Significantly more males (58%) were in full-time work than females (51%). Fewer males (21%) were unemployed than females (26%) and fewer males said they were in temporary jobs (17% male, 23% female).

Jobs gained were in accordance with traditional stereotypes. Girls were clustered mainly into 3 occupations: clerical (43%), retail (26%) and service work (12%). Boys were more evenly distributed over the job range though 33% of them were in trades. Job aspirations of the unemployed showed a similar trend with half the unemployed females looking for clerical jobs.

There was a very clear difference also in the tertiary destinations of boys and girls, particularly as regards enrolments at Universities and Colleges of Advanced Education. See Table 3.

Table 3 : Full-time students at University and C.A.Es. by sex

	Male	Female
University C.A.E.	51% 49%	39% 61%
Total Number	95	80

There were some striking differences among the Year 10 and 11 leavers also. The majority of Year 10 or 11 leavers had taken technical or commercial subjects. There was evidence of a tendency for teachers to encourage boys who had taken "technical" subjects to leave school and girls who had taken "commercial" subjects to stay on and take non-P.E.B. courses in Year 12. Sixty one percent of commercial respondents had been placed in the "continue with non-P.E.B. subjects" category as opposed to 41% of boys who had taken technical subjects. Conversely only 25% of these girls had been placed in the "Leave school" category compared with 39% of the boys.

These boys may not have been particularly good at school work and were rather less confident of their abilities in Maths and English than other male leavers. Nevertheless, they were less likely to be unemployed - 25% were - than the girls who took a commercial subject of whom 35% were unemployed.

Perceptions of school and career counselling

Leavers, both employed and unemployed at all year levels, made some negative comments on their schooling and many appeared to feel it had been irrelevant. Nevertheless, the majority of our respondents said they left school for very practical reasons such as having a job to go to or the desire to earn money. However, unhappiness at school was a consideration for those who left school during the year especially in Year 10.

Nearly all leavers who had any form of career counselling found it useful and their written comments were very positive on this topic. Overall however, the majority of respondents felt that had not been adequately provided for in this area.

Few leavers, particularly Year 12 leavers, recollected being counselled for unemployment.

Interestingly, the leavers from schools which had offered intensive career education courses seemed slightly less satisfied than their peers from traditional schools e.g. 57% of leavers from such schools said they had not had enough counselling compared with 53% from other schools. This, in fact, turned out to be one of the very few (and minor) differences we observed between these two groups.

Employment and Unemployment

About half the employed had been in jobs for three or more months and many of these said they had a job to go to when they left school.

Family and friends appeared to have been the main source of jobs, and this was most obvious in the trades. Direct approaches to places of work, especially in white collar occupations, was the next most common strategy.

Clearly, family and friends play a large role in the acquisition of jobs. This factor seems to be particularly important in non-white collar areas where 39% obtained their jobs this way, compared with 25% in the clerical and lower professional areas.

Table 4 : How did you get the job?

	White Collar	Trades	Rest	Total
Through Commonwealth Employment Service (CES) or other government agency	19%	7%	22%	18%
Through an employment agency	2%	1%	1%	1%
By responding to an advertisement in the paper	15%	28%	13%	17%
Through relatives or friends	25%	40%	38%	34%
By contacting places of employment yourself	34%	18%	24%	27%
Through the school	5%	6%	1%	4%
Total Number	227	121	294	642

More than half our respondents liked the kinds of work they were in. Job satisfaction diminished, however, among leavers in low status jobs and girls, especially, complained of a lack of opportunity for advancement in their jobs.

Our respondents were surprisingly stable and only 14% of them said they had ever left a job. Their most commonly given reasons were that the job was temporary or they were retrenched or sacked. Half of this 14% had found jobs but half were looking for work.

The majority of the unemployed appeared to have been out of work since leaving school and judging from teacher assessments, were less academically able than those in full-time jobs. Despite this, job aspirations were high, particularly among Year 12 leavers of whom 80% were looking for white collar jobs.

Few of the unemployed respondents appeared to be studying or utilizing community resources to any extent.

Judging from the response to our list of possible activities the girls saw themselves as more constructively occupied. Sixty-seven percent said they worked daily around the home compared with 34% of boys. They were also more likely to work in the community.

Boys on the other hand appeared to do more "hanging around with friends", one third saying they did this daily compared to only 15% of the girls. Very few leavers appeared to be utilizing community resources for the unemployed.

Thirty-six percent of unemployed leavers said they had considered returning to school and surprisingly this did not differ between pre-Year 12 leavers and non-matriculants who left at the end of Year 12.

Only 10% of our respondents said they were doing some studying and half of these were end of Year 12 leavers. However, only 21% had completely dismissed the idea of studying further in the future.

Obviously all leavers were inclined to be bored or depressed sometimes but the unemployed were more so as Table 5 shows.

Table 5 : During an average week how often do you feel bored or depressed?

	Never	Sometimes	Often	Mostly	Total
Full-time work	20%	65%	12%	4%	458
Unemployed	9%	56%	21%	13%	287

Discussion

It would seem useful for schools to follow up their students after they have left school if only out of human concern. Beyond this such studies would be an important means of evaluating schools, their programs and processes, especially those concerned with transition.

More immediately, this high rate of unemployment among the end of Year 12 leavers from non-P.E.B. courses clearly has implications for schools and further investigation seems warranted into why people stay on for Year 12 and what they hope to get out of it.

It would seem, also, that employers were using the matriculation examination as a yard stick for selecting Year 12 leavers. Efforts should be made to ensure that young people who do not have

matriculation should have something to peddle in the job market. Perhaps alternative courses to P.E.B. courses - the Secondary School Certificate for instance - could become more acceptable to employers through public education programs or whatever.

In fact, there is heartening evidence from a recent survey of employers that things may be changing and that the public examination is of less significance in job selection procedures[5].

By contrast the problems of early leavers seem insoluble tied as they are to the class/social structure. Efforts are made nonetheless. For instance, a pilot project to assist early leavers return to school to upgrade their qualifications on a part-time basis is underway in one South Australian high school. A more ambitious project which involves identifying students likely to be early leavers and developing strategies to help them stay at school is also underway in South Australia.

Overall, perhaps one of the most striking aspects of the survey was the sober and obvious desire of respondents for work. Indeed most of them said they left school to obtain jobs. The inactivity and depression of the unemployed only testifies to the importance of work in terms of structure and status in the lives of individuals. Clearly, a lot of work will have to be done to convince people that life without a job can be worthwhile.

References

1. W.F. Connell et al, 12-20: Studies of City Youth, Hicks, Smith and Sons, Sydney, 1975.

2. M. Tinney et al, The Luck of the Game : A Study of School Leavers in a Melbourne Inner Suburban School, A Research Project of the Brotherhood of St. Laurence, December 1974.

3. J. Bannon, G. Forbes, L. Horvat, Report of the Youth Unemployment Working Party, Department of Labour and Industry, South Australia, 1978.

4. I. Broom, F.L. Jones "Career Mobility in Three Societies: Australia, Italy and the United States", American Sociological Review 34 (1969), pp 650-8.

5. J. Keightley, E. Lyons, Employer Use of the School Leaver Statement, South Australian Education Department, 1980.

ANXIETY ABOUT EMPLOYMENT PROSPECTS, AND VOCATIONAL PREFERENCES OF HIGH SCHOOL STUDENTS

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Abstract

The relationship between anxiety, educational self-theory and vocational preference was investigated using two separate samples of Australian high school students (n_1 = 149, n_2 = 262). Anxiety was measured using the anxiety component of Zuckerman's Affect Adjective Checklist (AACL); a measure of self-theory was obtained via the Profile of Real/Ideal Scholastic Motivation (PRISM); and vocational interest was measured by Holland's Vocational Preference Inventory (VPI). It was hypothesized that high-anxious subjects would have a lower degree of differentiation on the VPI than low-anxious subjects, that there would be a positive correlation between anxiety and the Diversity of Ideas scores on PRISM, and that high-anxious subjects would select occupations of higher prestige than low-anxious subjects. All the hypotheses were supported. The results, which support the predictions of Walsh and Lewis (1972) (Hypothesis Two), and Grimm and Nachmais (1977) (Hypothesis Three), indicate that anxiety is clearly related both to diversity of ideas and to social factors such as extrinsic motivation and status. Directions for further research are suggested.

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Vocational preferences and the determinants of occupational choice have been linked with a number of factors including personality, achievement, abilities, self-concept and status (Grimm and Nachmias, 1977). Anxiety has also been linked with vocational choice. Kimes and Troth (1974) found that students exhibiting career indecision demonstrated significantly more trait anxiety than those students who had chosen careers. A possible inverse relationship between trait anxiety and career decision/satisfaction was suggested.

Sharf (1972) attempted to extend the Taylor-Spence Drive Theory to vocational choice behaviour and investigated whether high-anxiety subjects responded more slowly to competing occupational choices and faster to non-competing choices than low-anxiety subjects. Anxiety did not have any significant effect on vocational choices.

Walsh and Lewis (1972) investigated the relationship between personality variables, and college choices varying in congruency with response to Holland's Vocational Preference Inventory. While numerous aspects of personality were examined, anxiety in particular revealed a significant relationship with degree of congruity exhibited in college choice. Students who made congruent college choices demonstrated significantly less anxiety than students who were undecided or who made incongruent college choices.

In contrast to this, the relationship between anxiety, creativity and vocational choice was examined by Grimm and Nachmias (1977) who hypothesized that high divergent (creative) subjects would express occupational preference inconsistent with intellectual interest, that high anxious subjects would demonstrate relative consistency, and that high anxiety subjects would select high status occupations. The results confirmed these hypotheses. Thus, high anxious subjects tended to choose occupational interests similar to their intellectual interests, from a high prestige level.

The apparent conflict between these two studies, the latter hypothesizing high anxiety with inconsistency and the former high anxiety with congruity, demands some reconciliation. It might be argued that incongruity results in higher anxiety, and that as a response the individual attempts to

increase consistency, either real or imagined, in an effort to reduce anxiety. The Walsh and Lewis study contrasts self-report vocational interest with actual college choice, whereas the Grimm and Nachmias study contrasts self-report vocational interest with self-report indicators of intellectual interest. The former may be an indicator of real incongruity, the latter of imagined consistency.

The present study was designed to further investigate the relationship between trait anxiety, educational self-theory and vocational interest. Self-theory, as described by Epstein (1973) subsumes the idea of self-concept. Viewed as a set of postulates one has about oneself that can be tested and falsified, self-theory is more dynamic than the more static self-concept. Educational self-theory refers to that set of postulates one holds about oneself in the educational setting. The profile of Real/Ideal Scholastic Motivation (PRISM; Docking, 1979) is fundamentally a set of thirty such postulates to which the respondent can agree or disagree. It reveals an educational self-theory orientation in three dimensions; involvement with ideas, diversity of ideas and extrinsic-intrinsic motivation.

Epstein (1976) has suggested that lack of consistency or focus in self-theory will result in raised anxiety. This, and the findings of Walsh and Lewis (1972) enable one to hypothesize that:

(i) there would be a negative correlation between anxiety and the degree of differentiation on the VPI; where differentiation refers to the standard deviation of scores of an individual on the six vocational orientation scales of the VPI. (Holland, 1973, p.4)

(ii) there would be a positive correlation between anxiety and scores on the diversity component of PRISM.

The findings of Grimm and Nachmias (1977) regarding status suggests the third hypothesis, namely that:

(iii) high anxiety subjects would select occupations of higher prestige than low anxiety subjects.

Before these hypotheses can be investigated, the Vocational Preference Inventory needs to be validated for the sample chosen, by analysis of scale inter-correlations, scale means, and correlation between VPI scale and other measures.

METHOD

Subjects

Two samples of Year 10 (15-year-old students) were selected from Perth government schools. Sample one consisted of 149 students of whom approximately two-thirds were male. Sample two was taken from a similar senior high school of whom 46% of the 262 students were male.

Instruments

(i) PRISM (Profile of Real/Ideal Scholastic Motivation) provides an objective description of individual's frame of reference relating to education. It was first developed as part of the instrumentation for a study of staff/student cognitive style similarity and student achievement at tertiary level (Docking, 1976a, 1976b). PRISM consists of three component factors or subscales:

a) Involvement with ideas (Volume);

b) Diversity of ideas (Breadth);

c) Acceptance of externally set goals or standards (Motivation).

The items are statements about education to which students respond on a four point scale. Individual scores are determined by summing point values for each statement. Extensive validation has

been conducted on the scales (Docking, 1976a). In 1978, PRISM was updated and revised to allow for wider application of the profile. Further validation of the profile is reported in Docking (1979).

(ii) AACL - a modifcation of the Zuckerman Multiple Affect Adjective Checklist (MAACL) (Zuckerman, 1960, Docking and Thornton, 1979). The scale consists of the 21 key anxiety words of the MAACL embedded in 39 adjectives serving as suitable descriptors of a secondary or tertiary course.

Words are listed in alphabetical order. To measure vocational anxiety the subject is asked to underline any words which describe how they generally feel when thinking about getting a job. Sample two also completed a Trait version of the AACL.

(iii) VPI - Holland's Vocational Preference Inventory (Holland, 1975) was used as a measure of vocational interest. Some American occupational titles were modified so as to be suitable for use with Year Ten Australian students. The VPI has eleven subscales, six reflecting vocation-type preference (Realistic, Intellectual, Social, Conventional, Enterprising and Artistic) and five other scales (Self-control, Masculinity, Status, Infrequency and Acquiescence). Individual Differentiation is determined from the standard-deviation of the scores on the first six scales.

Procedure

Students were informed that the questionnaire measured attitudes toward school and vocational aspirations. The PRISM and AACL were administered first, followed by Holland's VPI. Administration of the instruments took 30 minutes to complete.

Data Analysis

A correlation analysis was performed on each anxiety measure, achievement levels, all VPI scale scores, VPI differentiation and PRISM sub-scale scores.

As a check on the validity of the VPI instrument in Australian schools, the pattern of VPI scale inter-correlations was compared with those of Holland, Whitney, Cole and Richards (1969), Crabtree (1969) and Folsom (1971), using Spearman's Rank Order Correlation Analysis.

In order to assess the relationship between anxiety and differentiation of career preference, correlation was computed between anxiety scores and the standard-deviation of the VPI vocational scale scores of each subject in both samples. This measure of differentiation was regarded as preferable to the range measures by Holland (1973).

The level of significance was set at 0.05.

Result

Before reporting data relating to the hypotheses, the validity of the VPI with Australian subjects must be assessed. The inter-correlations of the six VPI vocational scales are shown in Figure 1, using the hexagonal model described by Holland, et al. (1969).

The vocational scale inter-correlations were compared to those given in Holland, et al. (1969, p.23) by ranking and calculating Spearman's ρ as Crabtree (1969) had done. Although the VPI correlations differed in magnitude, the rank correlations indicated that they conformed to a very similar pattern to those found by Holland and by Crabtree. (*Sample 1*: $\rho = .52$, $p < 0.05$; *Sample 2*: $\rho = .67$, $p < 0.01$).

The means on the 11 VPI scales were compared with those reported for high school children (9 - 12 years) by Holland (1975, p.31) and no significant differences were found for either sample. It would

appear that the VPI instrument, with the minor alterations mentioned earlier, is transferable to Australian school children.

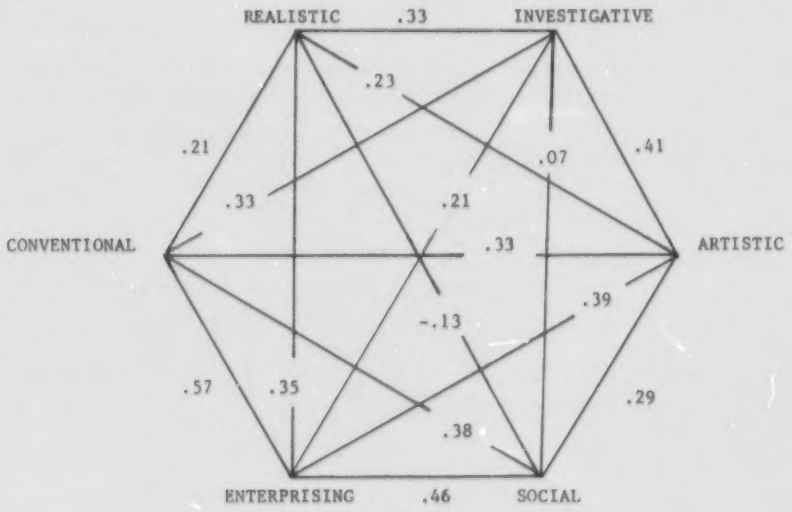

Figure 1. Hexagonal Model displaying similarity between vocational types. (After Holland, et al., 1960).
(*Sample 2, n = 262*)

The correlations of the VPI scales with other variables are summarized in Table 1.

Table 1. Correlation with VPI Scale

	VPI Scale							
	Realistic	Social	Artistic	Conventional	Self-Control	Masculinity	Status	Infrequency
SEX	-.41	.42			.49		.36	.45
PRISM: Volume					.20			
Breadth		.31	.21		.25		.39	.28
Motivation		.55		.26	.37	.58	.79	.72
ANXIETY: Trait		.41		.20	.32	.61	.74	.75
DIFFERENTIATION	(Used in calculation of this variable)				.42		-.20	.3

(*Sample 2: n = 262*) The intellectual, Enterprising, and Investigative Scales did not correlate significantly with any of the variables listed below. Only significant correlations are shown. ($p < .01$)

The VPI - PRISM correlations conform to the findings reported in Holland (1975) for similar scales. Thus, PRISM: *Volume* does not correlate with any of the six VPI vocational scales (nor do *Intellectual Efficiency* in the California Personality Inventory, or *Achievement* in the Edwards Personal Preference Schedule). PRISM: *Breadth* performs similarly to the *Flexibility* scale of the CPI and PRISM: *Extrinsic Motivation* to the *Achievement by Conformity* scale of the CPI (Holland, 1975, p.25-26). The correlations in Table 1 conform to expectations derived from Holland's empirical summaries of each VPI scale (Holland, 1975, p.10-13) and further validate its use.

VPI Trait anxiety correlations also generally agree with the results of other studies. The Q4 scale of the 16PF Test (*Ergic tension - Tense/Relaxed*) shows no relationship to any of the six vocational VPI scales except *Conventional* (Holland, 1975, p.26) and this too is reflected by the data reported in Table 1. In this study, it was also found that trait anxiety correlates with the *Social* scale and with *Self-control, Masculinity Status* and *Infrequency*. While these findings differ from Holland's data, the strong correlation with *Status* is hypothesized by Grimm and Nachmias (1977). No significant correlations at all were observed with the Vocational measure of anxiety from either sample. Trait anxiety was also found to correlate with the PRISM scales of *Breadth* (.23) and *Extrinsic Motivation* (.13).

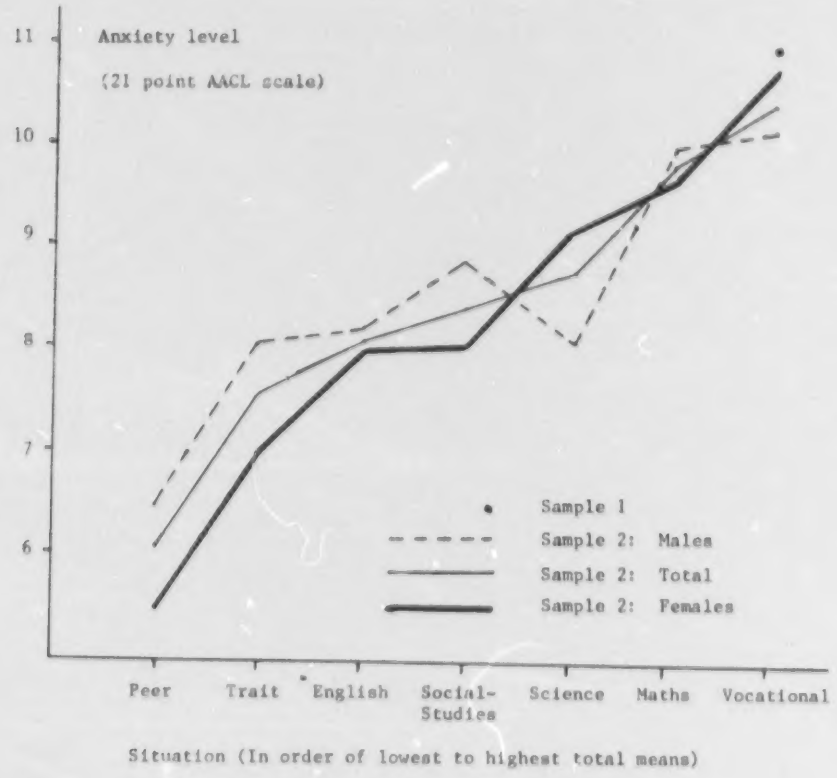

Figure 2. Mean Anxiety Levels

VPI: *Differentiation* and *vocational anxiety* were found to be correlated (-.15) as were *Self-control*, *Status* and *Infrequency*. Differentiation is a measure of the extent to which an individual's responses to the six scales (Realistic, Investigative, Artistic, Social, Conventional or Enterprising) differentiate between vocational types. It is not surprising, therefore, to find individuals expressing less *self-control* (inhibition, responsibility), selecting higher *status* positions (adventurous choices) and popular vocations (low *Infrequency*) tend to be undifferentiated on the VPI.

Vocational anxiety levels were high at both schools, significantly higher than anxiety in any other area (peer or academic), and higher than trait anxiety (*Sample 2*: $p < 0.001$). Vocational anxiety was marginally lower for *Sample 2*, who were studying vocations, than for *Sample 1* who were not ($p < 0.02$).

The sex differences on the VPI scales reported in Table 1 conform in direction to the data reported by Holland (1975) except for Masculinity, for which a significant negative correlation would be expected. (The variable sex was scored male=1, female=2).

Discussion

The validity of the VPI is confirmed above by comparison with previous research which shows similar patterns of VPI scale means and inter-correlations.

All hypotheses are supported by the data, although the relationship between differentiation and anxiety, suggested by the first hypothesis, is very weak.

It has been suggested in other studies (e.g. Grimm and Nachmias, 1977, Kimes and Troth, 1974) that counsellors should consider anxiety when giving vocational advice. While the problem of causality (does high anxiety cause vocational indecision, or the other way around?) makes this a rather shaky recommendation, the weakness of the relationship between anxiety and uncertainty indicated in this study suggests that it would be quite unwise.

The significant correlation between PRISM: *Diversity of Ideas* and Trait Anxiety confirms the second hypothesis. Epstein (1976) suggests that the uncertainty involved in divergence would be threatening and anxiety provoking. It is not surprising to find high anxiety also associated with meeting the demands of others (*Extrinsic Motivation, Conventional, Social and Status*).

The third hypothesis, suggesting that high anxious individuals will select high *status* vocations, is in agreement with the social-conventional perspective of the student indicating the need to impress and please others. This relationship was quite strong ($r = 0.79$). Sex differences can account for many of these results, as females tended to be higher in anxiety, social orientation and status consciousness.

These findings suggests a number of significant lines of research, particularly in relation to the characteristics of high anxious children and the coping strategies they could employ. It is not clear whether high anxiety sensitises one to the expectations and demands of others, or whether the perceived expectations or demands of others results in high anxiety, but in either case, constructive coping is likely to involve the internalization of values and standards, and the development of the ability to make independent judgments and to respond to intrinsic motives. "Thus, by internalizing the values of significant others, the child reduces a major source of anxiety that of disapproval from significant others" (Epstein, 1976, p.190).

REFERENCES

Crabtree, P.D. A Test of Holland's Hexagonal Model of Occupational Classification Using a Rural High School Population. Unpublished doctoral dissertation, Ohio University, 1969.

Docking, R.A. Staff-Student Interaction at Tertiary Level. Unpublished Ph.D. thesis, Monash University, 1976a.

Docking, R.A. Intellectual environment and academic achievement at tertiary level. The Australian Journal of Education, 1976b, 20(1), 100-101.

Docking, R.A. and Thornton, J.A. Anxiety, achievement and cognitive incongruence. Australian Journal of Education, 1979, 23(3), 250-261.

Docking, R.A. PRISM: User's Manual. Perth: Murdoch University, 1979.

Epstein, S. The self-concept revisited : Or a theory of a theory. American Psychologist, 1973, 28(5), 404-416.

Epstein, S. Anxiety, arousal and the self concept in Stress and Anxiety, Vol.3. I.G. Sarason and C.D. Spielberger (Eds.), Washington, D.C.: Hemisphere Publishing Corporation, 1976, 183-224.

Folsom, C.H. Jr. The Validity of Holland's Theory of Vocational Choice. Unpublished doctoral dissertation. University of Maine, 1971.

Grimm, V.E. and Nachmias, C. The effect of cognitive style and manifest anxiety on intellectual and vocational interest in adolescents. Journal of Vocational Behaviour, 1977, 10, 146-155.

Holland, J.L. Making Vocational Choice : A Theory of Careers. Prentice-Hall, 1973.

Holland, J.L. Manual for the Vocational Preference Inventory. Palo Alto: Consulting Psychologist Press Inc., 1975.

Holland, J.L., Whitney, D.R., Cole, N.S. and Richards, J.M. Jr. An empirical occupational classification derived from a theory of personality and intended for practice and research. ACT Research Report No.29. Iowa City: The American College Testing Program, 1969.

Kimes, H.G. and Troth, W.A. Relationship of trait anxiety to career decisiveness. Journal of Consulting Psychology, 1974, 21(4), 277-280.

Sharf, R.S. An attempt to extend Taylor-Spence drive theory to vocational choice behaviour. Journal of Vocational Behaviour, 1972, 2, 343-351.

Walsh, W.B. and Lewis, R.O. Consistent, inconsistent and undecided career preferences and personality. Journal of Vocational Behaviour, 1972, 2, 309-316.

Zuckerman, M. The development of an affect adjective checklist for the measurement of anxiety. Journal of Consulting Psychology, 1960, 24(5), 457-462.

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Bias in HSC Scores and Equality of Access to Universities

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Introduction

That there should be equality of opportunity in education is a well accepted principle. There are, however, differing views on how equality of opportunity should be evaluated and what measures may reasonably be taken to effect it.

This paper is concerned mainly with equality of opportunity in the transition from school to university. This issue requires some consideration of the high school population. The Interim Committee for the Australian Schools Commission (1978) pointed out that historically, concern with equality of opportunity in high schools has been confined to the government schools. The Committee found this strange because some independent high schools provide three times the resources that the government schools do while some others provide substantially less than do the government schools. To support the inclusion of independent schools in considerations of equality of opportunity, the Committee pointed to unequal retention rates in the different high school sectors. For example, the 1972 year 12 retention rate for Australian non-catholic non-government schools was 87% while for the government schools it was 27%.

It is clear that this higher retention rate for high socio-economic status (SES) students carries over to the transition from high school to higher education through superior performance on the final year high school examinations. The imbalance in the SES of the university student population is a worldwide phenomenon and has been documented for example by Smurthwaite (1976) at Monash, Lee Dow et.al. (1972) at Melbourne and by van Wieringen (1976) in Holland. Table 1, taken from Lee Dow et al. shows the fathers' occupations of students entering the University of Melbourne in 1970 and compares these with the Victorian male workforce

Table 1

Percentages of the various occupations of the fathers of students entering the University of Melbourne in 1970 and of the Victorian workforce.

Occupation	Students' Fathers	Vic. Male Workforce
Professional	24	7.0
Administrative & Managerial	26	8.3
Clerical & Sales	9	14.5
Farmers, Craftsmen, Process Workers & Labourers	25	62.4
Others	16	6.8

The mere fact of imbalance in the SES of university students has led some writers to state that university selection procedures are biased against or discriminate against students from the lower SES groups. For example, Silverberg (1974) states "The effect of selection according to secondary school performance is principally to discriminate against less privileged socio-economic groups"(p12). Smurthwaite (1976) and

West and Siamowicz (1976) also argue that the HSC discriminates against certain groups. Smurthwaite states, "Anotner major argument levelled against the HSC is that it is biased in favour of the socially privileged."(p5). The imbalance in the SES distribution of university students along with the interpretaiton of unfair discrimination has led to proposals of using a ballot for selection and such a ballot was accepted by the government of Holland.

The universities do not deny the relationship between university entrance criteria and SES. Potter (1976) for example, states "It has to be conceded that the moderate student at the same (ie miserable backwater) school will have less chance of entry than a candidate of perhaps the same natural ability at a better school."(p3). However, while they accept that the facilities provided by independent schools do increase the HSC scores of students, the universities claim to be non disciminatory at the point of entry. Potter (1976) states, "In admitting students to university, however, one is not seeking a representative group, but those that have demonstrated that they can best profit from the opportunity." (p 3). Finch (1977), in a similar vein states, "the extent to which one can sustain the factual claim that current selection procedures per se do not provide equality of access (is arguable)."(p 33).

Thus, on the one hand, the proponents of the inequality of access position argue that the socio-economic imbalance in HSC results and university populations implies unfair discimination, while, on the other hand the universities argue that selection procedures are fair in that they select those most likely to succeed without reference to applicants' backgrounds. The latter group do however admit to the presence of unequal educational opportunity in high schools while disclaiming any responsibility for or obligation from it.

There has been a weakening in some instances of the sole reliance on academic criteria for the purposes of selection into higher education. These have not been without controversy. The institution of special admissions programs in some U.S. universities has led to the de Funis and Bakke cases. In spite of legal difficulties, special admissions programs are continuing in the U.S.A. Also, the Carnegie Council on Policy Studies in Higher Education (1977) has recommended a broadening of selection criteria for higher education, particularly for entrance to professional courses. They stated, 'an institution of higher education with selective admissions is choosing a student body and not just judging a footrace based on "objective" credentials when it makes its selections (p3)'. They recommended 'consideration for the contributions that students prospectively may make, not only to their own advancement, but also to their fellow students and their fellow men afterwards (p3)'. This student body approach to selection is currently being used in the University of Newcastle Faculty of Medicine where attempts are being made to combine academic with other criteria to select a group of students who will make good doctors in addition to meeting the academic requirements of the course.

Nevertheless, in most Australian university courses, selection is carried out using academic results as the sole criteria. This paper is basically concerned with the injustice that might arise from defining academic merit for the purpose of university selection, as the quota score obtained in the HSC examination. If each quota score predicts the same university result for all identifiable groups of university applicants, then from the universities' point of view, the use of quota scores to rank all

students might be a fair procedure. If, however, it can be shown that the same quota score implies a different level of university performance for two or more distinguishable groups of applicants, then the use of quota scores to rank all applicants involves unfair discrimination against the groups of applicants whose expected university results are higher for a given quota score. In this case, quota scores can be said to be biased against some groups in the way they predict university results. Bias here has a clear psychometric meaning that is quite distinct from the meaning applied by Slamowicz et al. (1976) for example, who state, "By a bias we mean a distinctly higher or lower percentage representataion of a category than in the population at large"(p17). In the terminology used here, what Slamowicz et al. call bias would be called an imbalance which may or may not be caused in part or whole by bias.

No researchers have looked at bias in the Australian HSC scores and studies carried out in the U.S.A. have been carried out in educational contexts too different from the Victorian one to permit comparisons to be made. In the absence of empirical evidence it is easy to find a logical basis for bias in any direction. For example, Slim (1967) speaking to the headmasters of Australian independent schools stated that compared with other schools, "...you do more than instil knowledge, you build character (pxv)." From this it could be hypothesized that as character would aid in the transition to university, independent school students should do better than state students having the same HSC results. On the other hand, it could be hypothesized that in the more egalitarian environment of the university, the state school students should do better than independent school students having the same HSC results. In this situation, the present study was necessarily exploratory.

Analyses.

Students entering the Faculties of Arts and Science and in 1975, 1976 and 1978 for whom complete data were available served as subjects for the study (no background data were available for the 1977 cohort). These two faculties were chosen because they represent both the humanities and the sciences and because their enrolments were large enough to permit regression equations to be adequately estimated.

Regressions were computed separately for students in each faculty because university assessments are different across faculties. The students were also separated by sex because Seashore (1962) and Linn (1973) have shown regression to be different for males and females. Thus the students were grouped by sex, faculty and type of school (state, catholic and independent). The students from the three entering cohorts were combined on the assumption that standards of HSC and university assessments did not change markedly over this period and because independent analyses for each cohort showed marked consistencies.

Table 2

Results of regression analyses for Male Faculty of Science students.

Parameter	Independent	State	Catholic
Sample size	215	394	172
Mean Quota Score	312	307	310
Mean GPA	29.4	30.4	29.3
S.D. Quota Score	34.1	27.7	29.4
S.D. GPA	12.4	11.9	11.8
Correlation	.7586	.6386	.6707
Equation	-56.5 + .2749Q	-53.93 + .2749Q	-54.0 + .2691Q
Interval	271 to 345		

Table 3

Results of regression analyses for Male Faculty of Arts Students

Parameter	Independent	State	Catholic
Sample size	102	80	70
Mean Quota Score	313	313	315
Mean GPA	29.3	33.3	30.9
S.D. Quota Score	28.2	25.0	27.5
S.D. GPA	10.7	11.1	10.1
Correlation	.4700	.3752	.6128
Equation	-26.7 + .1786Q	-18.8 + .1660Q	-39.8 + .2248Q
Interval	285 to 337		

Table 4

Results of regression analyses for Female Faculty of Science students.

Parameter	Independent	State	Catholic
Sample size	161	190	104
Mean Quota Score	301	300	304
Mean G.P.A.	27.9	31.0	29.3
S.D. Quota	21.7	22.2	23.8
S.D. G.P.A.	9.7	11.4	12.0
Correlation	.4865	.4852	.6310
Equation	-37.8 + .2183Q	-43.8 + .2497Q	-67.2 + .3175Q
Interval	279 to 336		

Table 5

Results of regression analyses for Female Faculty of Arts Students.

Parameter	Independent	State	Catholic
Sample size	270	324	211
Mean Quota	312	310	309
Mean G.P.A.	28.2	28.3	27.9
S.D. Quota	26.1	25.0	24.3
S.D. G.P.A.	9.9	9.7	9.9
Correlation	.5006	.4606	.5292
Equation	-31.1 + .1904Q	-26.9 + .1779Q	-38.7 + .2160Q
Interval	304 to 316		

The first step was to compute the least squares linear regressions of university GPA on HSC quota scores for each of the 12 samples (two sexes by three school types by two faculties). University GPA is a weighted average of grades obtained in first year courses. The GPA scale ranges from 10 for complete failure in all subjects, through 20 for averaging a pass in all subjects, 30 for averaging HDs to 60 for averaging all HDs or As. Tables 2 and 3 show the results relevant to the regression analyses for males in the Faculties of Science and Arts respectively and Tables 4 and 5 show the results for females. All of the correlations shown in Tables 2 through 5 are significantly different from zero.

Interpretation of Regression Analyses

a) Correlations

The correlations shown in Tables 2 through 5 are usually used to evaluate quota scores as a selection variable. Silverberg (1974) for example squared such correlations and concluded that HSC quota scores were poor predictors of university results. This fails to take account of the attenuation of the correlation coefficient by selection. A reasonable way to evaluate selection procedures is to correct the

obtained correlation for restriction of range by selection using the formula given by Lord and Novick (1968). The formula requires that the standard deviation of the selection variable in the unselected population be known. The standard deviation of the quota

Table 6

Correlations corrected for restriction of range.

Sample	Sample Correlation	Corrected Correlation
Ind. Science Males	.7586	.8629
State Science Males	.6386	.8317
Catn. Science Males	.6707	.8383
Ind. Arts males	.4700	.6865
State arts Males	.3752	.6292
Catn. Arts Males	.6128	.8157
Ind Science Females	.4865	.7887
State Science Females	.4852	.7833
Catn Science Females	.6310	.8631
Ind Arts Females	.5006	.7423
State Arts Females	.4606	.7888
Catn Arts Females	.5292	.7888

scores of all students sitting the HSC in Victoria is about 50. Table gives estimates of what the correlations between quota scores and university results would be if all HSC sitters were admitted. They average .83 for students in the Faculty of Science and .74 for students in the Faculty of Arts. When it is taken into account that neither high school achievement nor university achievement is measured with perfect reliability, these high correlations indicate that HSC quota scores are a very good predictor of university results at Melbourne University.

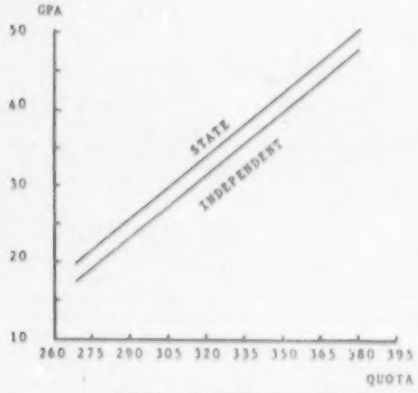
b) Regression Equations

The initial comparisons will be restricted to independent and state school samples. The Interim Committee for the Australian Schools Commission (1978) and Williams and McDonnell (1977) showed the catholic schools as a group to be in between the independent and state schools on measures of disadvantage such as school retention rate and family SES.

Figures 1 through 4 are graphs of the regression equations for Independent and State school students shown in Tables 2 through 5 respectively. These show that in every case, the regression lines for the state school students are higher in the region of the cut-off than the regression lines for the independent school students. What this means is that the average GPA of state school students having a given quota score is greater than the average GPA of independent school students having the same quota score at the critical point where exclusion decisions are made.

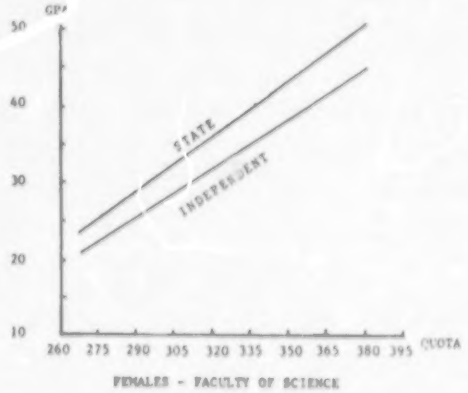
In order to be confident that the effects shown in Figures 1 through 4 are stable, we need to test the statistical significance of the differences between the regression equations. There are several ways to do this. One useful test is the Johnson and Neyman (1936) procedure which gives a range of scores on the

predictor within which the hypothesis that the regression lines are equal would be rejected. This test is fairly conservative, but it is easy to interpret. Because interest is mainly in regression differences in the region of the cut-off, the Potthoff (1964) modification of the Johnson-Neyman procedure which



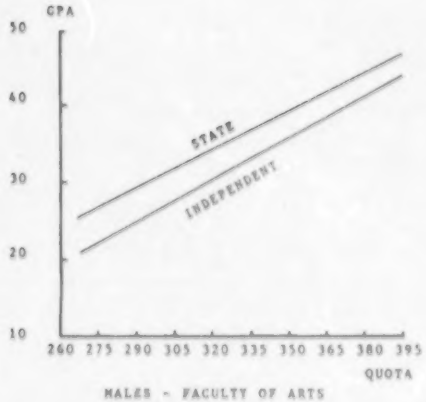
MALES - FACULTY OF SCIENCE

FIGURE 1



FEMALES - FACULTY OF SCIENCE

FIGURE 3



MALES - FACULTY OF ARTS

FIGURE 2

FEMALES - FACULTY OF ARTS

FIGURE 4

provides simultaneous confidence intervals for the whole range of the predictor was not used. The Jonnson-Neyman intervals for the State and Independent school regressions are shown as the intervals in Tables 2 through 5. For constant sample size, the larger the difference between the regression lines, the wider the Jonnson-Neyman intervals. In all faculties for the male students, and for females in the Faculty of Science, the Jonnson-Neyman intervals extend to the region of the cut-off.

It is perhaps worthwhile to underline the importance of the effects shown in Figures 1 through 4. They show a real and consistent bias in the way quota scores predict university results. When evaluating such effects it is important to eliminate scaling or other artifactual causes of the bias. For example Linn (1973) has shown this sort of effect in the way college grades predict law school grades in the U.S.A. However, because colleges in the U.S. use their own assessment scales, Linn concluded that the apparent bias was most likely the result of different standards being used by different colleges.

In the present study, students were separated by faculty to control for the effects of different subjects and different standards of assessment. The quota scores used come from the Victorian HSC in which students taking the same subjects sit the same examination and the standardization procedure adjusts the scores of different subjects to have approximately the same difficulty level. Further, within the three

faculties studied, there were no differential subject patterns which which could account for the bias.

All this supports the conclusion that the bias shown in the study is a real property of the variables being measured. At least some of the higher HSC achievement of the independent school students does not carry over to their performance at university.

Fair Selection Procedures

A large body of psychometric literature has recently developed in the U.S.A. which examines ways of setting up selection models which provide equality of opportunity. One whole issue of the Journal of Educational Measurement was devoted to articles presenting and evaluating such models.

It is proposed here to discuss the above results in the light of two such models, namely the regression model and the decision theoretical model. A number of models called group parity models will not be considered because they have been shown by Peterson and Novick (1976) to be internally inconsistent.

a) The Regression Model

The regression model simply requires that those applicants be treated as equal whose predicted GPAs are equal. Tables 7 and 8 show for males in the Faculties of Science and Arts respectively, some predicted GPAs equivalent quota scores for independent and state school applicants and the differences between these equivalent quota scores. Tables 9 and 10 give these results for the females.

Table 7

Predicted GPA and equivalent quota scores - Males, Faculty of Science

Predicted GPA	Independent School Quota Score	State School Quota Score	Difference
48	380	371	9
42	360	351	9
37	340	331	9
31	320	311	9
26	300	291	9
20	280	271	9

Table 8

Predicted GPA and equivalent quota scores - Males, Faculty of Arts

Predicted GPA	Independent School Quota Score	State School Quota Score	Difference
41	380	361	19
38	360	340	20
34	340	318	22
30	320	297	23
27	300	275	25
23	280	254	26

Table 9

Predicted GPA and equivalent quota scores - Females, Faculty of Science

Predicted GPA	Independent School Quota Score	State School Quota Score	Difference
45	380	356	22
41	360	339	21
36	340	321	19
32	320	304	16
28	300	286	14
23	280	269	11

Table 10

Predicted GPA and equivalent quota scores - Females, Faculty of Arts

Predicted GPA	Independent School Quota Score	State School Quota Score	Difference
41	380	383	-3
37	360	362	-2
34	340	340	0
30	320	319	1
26	300	297	3
22	280	276	4

The critical decisions between applicants are made in the region of the cut-off. In the Faculties of Science and Arts, the cut-offs are usually about 280. Thus the last lines of Tables 7 through 10 give equivalent cut-offs under the regression model of fair selection. The equivalent cut-offs for state school students are lower than those for independent school students. That is, under the regression model of fair selection, we should accept state school students having lower quota scores than indpendent school students.

b) The Decision Theoretical Model

An alternative way of achieving equality of access is to use one of the decision theoretical models based on Von Neuman and Morgenstern's (1947) Theory of Games and Economic Behavior. One of the advantages to using such models is that they provide a systematic way of incorporating social and educational values into the decision making process.

There is much support for the decision theoretical approach among psychometricians. Petersen and Novick (1976) state, "Most statisticians interested in decision problems accept the correctness of the Von Neuman and Morgenstern-Wald Model and the incorrectness of any statistical decision procedure that does not conform to that model." (p25). Thorndike (1974), Linn (1976) and Cronbach (1976) have also supported the decision theoretical approach to obtaining equitable selection decisions. There are two decision theoretical approaches which may be used, namely the Bayesian approach which incorporates prior information into the decision and the traditional approach which does not. For simplicity, the traditional approach will be followed here.

The decision theoretical models are based on two measures, namely a conditional probability and a utility. The conditional probability is the probability of a specified outcome (e.g. passing first year university) given certain characteristics of the applicant (e.g. a state school student with a quota score of 300). If the assumption of a truncated bivariate normal distribution is made, then the regression analyses presented above can be used to estimate all of the required conditional probabilities. For example, the probability of a male student in the Faculty of Science whose quota score was 300 passing is:

$$p(\text{pass} \mid 300) = p\left(z \geq \frac{20 - (-53.93 + .2749 \times 300)}{11.9 \sqrt{(1 - .6386^2)}}\right)$$

where z has a standard normal distribution.

$$= p(z \geq -.93)$$

$$= .82$$

The utilities are quantified social and educational values. To use the decision theoretical model it is necessary that a number be assigned to each possible decision-outcome combination. This represents its social and educational value. So, for example, a number must be assigned to accepting a student from a state school who subsequently passes first year and to rejecting an independent school student who would have passed first year.

Figure 5 schematizes the selection problem in terms of a bivariate relationship between quota score and GPA. There are two possible outcomes for the criterion, namely success and failure. The critical point

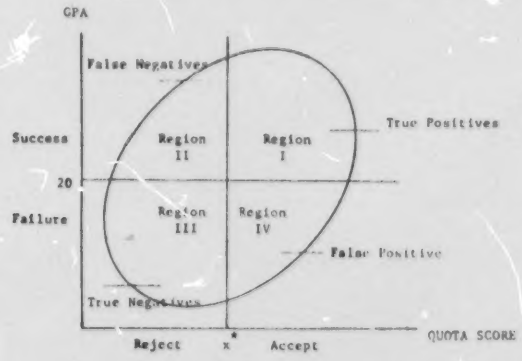


FIGURE 5

on the GPA scale which discriminates success from failure is 20, which corresponds to passing (on the average) in all subjects taken. For each individual there are two possible decisions, namely to reject or accept. Q* corresponds to the cut-off for a particular group.

Table 11 presents a set of utilities that might be applied to the possible decision-outcome combinations shown in Figure 5. Thus I have assigned a positive value of 1 to making correct decisions and a negative value of 1 to making incorrect decisions. The decision theoretic models all assume that utilites are on an interval scale. What this means in terms of the utilities in Table 11 is that I feel that the two correct decisions are equally good and that the incorrect decisions are not only as bad as each other, but just as bad as the correct decisions are good. You might feel that some of these utilities should be changed.

In the decision theoretical models, decisions are made so as to maximise expected utility, which is to

Table 11

Possible utilities for certain outcomes.

	REJECT	ACCEPT
SUCCEED	-1	1
FAIL	1	-1

maximise the social and educational benefits as expressed by the utilities assigned to decision-outcome combinations. Expected utility is defined as the sum of products of utilities by conditional probabilities. In the university selection situation we are really deciding between individuals. Consider any two applicants i and j. There are two decisions that may be made, namely:

d1 : select i and reject j

d2 : select j and reject i

Until the quota is filled, rejection in effect means that the applicant is considered for the next place in the quota.

Let the following be the utilities for applicant i of the various decision-outcome combinations:

	reject	select
pass	ui1	ui2
fail	ui3	ui4

Let qi be the quota score for person i, and p(pass | qi) be the probability that person i will pass given his or her quota score. The expected utility of d1 is then:

(1) $E(U \mid d1) = ui2\ p(pass \mid qi) + ui4\ p(fail \mid qi) + uj1\ p(pass \mid qj) + uj3\ p(fail \mid qj)$

and the expected utility of d2 is :

(2) $E(U \mid d2) = uj2\ p(pass \mid qj) + uj4\ p(fail \mid qj) + ui1\ p(pass \mid qi) + ui3\ p(fail \mid qi)$

We choose d1 if

(3) $E(U \mid d1) > E(U \mid d2)$

That is if

(4) $ui2\ p(pass \mid qi) + ui4\ p(fail \mid qi) + uj1\ p(pass \mid qj) + uj3\ p(fail \mid qj)$
$> uj2\ p(pass \mid qj) + uj4\ p(fail \mid qj) + ui1\ p(pass \mid qi) + ui3\ p(fail \mid qi)$

That is if

(5) $(ui2 - ui1)\ p(pass \mid qi) + (ui4 - ui3)\ p(fail \mid qi) > (uj2 - uj1)\ p(pass \mid qj) + (uj4 - uj3)\ p(fail \mid qj)$

This result is completely general and can be used to rank students for the purposes of university entrance. It is a special case of the result found by Gross and Su (1975). The term on the left of Equation 5 might be called the utility rating of applicant i. Selecting students according to this utility rating will maximise the expected utility of the overall entering group.

Because the regression analyses above imply that applicants from different school backgrounds having the

Table 12

Utility ratings and equivalent quota scores - Males, Faculty of Science

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
2.00	380	385	-5
1.99	360	362	-2
1.93	340	339	1
1.69	320	316	4
1.08	300	294	6
.09	280	271	9

Table 13

Utility ratings and equivalent quota scores - Males, Faculty of Arts

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
1.95	380	372	8
1.88	360	349	11
1.73	340	325	15
1.46	320	302	18
1.07	300	279	21
.55	280	255	25

Table 14

Utility ratings and equivalent quota scores - Females, Faculty of Science

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
1.99	380	375	5
1.97	360	353	7
1.89	340	332	8
1.69	320	312	8
1.27	300	292	8
.61	280	271	9

Table 15

Utility ratings and equivalent quota scores - Females, Faculty of Arts

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
1.97	380	383	-3
1.92	360	361	-1
1.77	340	340	0
1.50	320	319	1
1.03	300	297	3
.41	280	276	4

same quota score have different probabilities of success, it follows that applicants from different school backgrounds having the same quota score will have different utility ratings, even though the utilities taken from Table 11 are the same for each group. It is possible to compute the quota scores for state

and independent school students whose utility ratings are equal. Tables 12 through 15 show equivalent quota scores of applicants for a number of utility ratings. As the utilities used were the same for independent and state school students and only pass/fail outcomes were considered, this selection model is the special case referred to by Peterson and Novick (1976) as the equal risk model. It equates those applicants having the same probabilities of success.

One important point to note from comparing Tables 7 through 10 with Tables 12 through 15 is that there are differences between the equivalent quota scores for the decision theoretical model and the regression model of fair selection. Even in the case of males in the Faculty of Science for whom the regression coefficients of state and independent school students are equal (see Table 2), the differences between equivalent quota scores using the decision theoretical model are not constant. This is in part because the correlations for the state school students were generally lower than those of the independent school students which makes the outcomes for state school applicants less certain. This lower predictability affects the decision theoretical model because it is based on probabilities, but does not affect the regression model which is based only on the average GPA for a given quota score.

Table 11 presents one of an infinite number of possible value systems that could be applied to selection decisions and their outcomes. It might be instructive to examine the effects of another system. We might argue that one of the major concerns of universities is academic excellence and not just passing as is implied by the utilities in Table 11. We might wish to apply a higher utility to doing well than we do to passing. This might be done in any number of ways. Novick and Lindley (1978) show how to use a continuous normally distributed utility function. Table 16 is

Table 16

Utilities taking academic excellence into account

	REJECT	ACCEPT
GPA≥30	-2	2
20≤GPA<30	-1	1
GPA<20	1	-1

another possibility using a discrete utility function. Here we have distinguished those students who average H3 or better from those who only pass. I have decided that accepting a student who does well is twice as good as accepting a student who passes. This represents the value that I place on academic excellence.

Using the utilities in Table 16 and the corresponding conditional probabilities of the outcomes

for each quota score, we can again compute the utility ratings applicants from independent and state schools. Table 17 gives the equivalent quota scores of males in the Faculty of Science, for a

Table 17

Utility ratings and equivalent quota scores using utilities in Table 16 - Males, Faculty of Science

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
3.97	380	380	0
3.87	360	358	2
3.54	340	335	5
2.83	320	314	6
1.70	300	292	8
.33	280	270	10

number of utility ratings using the value system expressed in Table 16. Comparing equivalent quota scores for the new utility system with those for the previous one shown in Table 12, we note a small change in the equivalent quota scores that favours the state school students. This is because the state school students have a greater probability of doing well than the independent school students.

The important point to note is that all of the above fair selection procedures show that the current practice of ranking applicants to university using quota scores is unfair to applicants from state schools. Fair selection procedures require that a lower cut-off be used for state school applicants than for independent school applicants.

Positive Discrimination

In both of the above examples, the same utilities were applied to the state and independent school applicants. It is of course possible to use different utilities for applicants having different school backgrounds.

For example, Melbourne University Council might decide that in the light of the above results, there is an imbalance in the socio-economic background of the population of Melbourne University graduates that has resulted from inequitable selection procedures in the past. The Council might then decide that in order to redress past inequities, a greater preference will be given to applicants from less privileged backgrounds. A rational way to effect such a policy would be to use the decision theoretical model and to use larger utilities for the success outcomes of state school applicants. So, for example, the utility of accepting a state school student who passes might be set at 1.5 implying that it is 50% more desirable to accept a state student who passes than to

Table 18

Utility ratings and equivalent quota scores using positive discrimination - Males, Faculty of Science

Utility Rating	Independent School Quota Score	State School Quota Score	Difference
2.00	380	309	71
1.99	360	309	51
1.93	340	307	33
1.69	320	299	21
1.68	300	285	15
.09	280	266	14

accept an independent school student who passes. Table 18 gives the equivalent quota scores for male students in the Faculty of Science when the independent school students have the utilities shown in Table 11 and the state school students have the same utilities except for a utility of 1.5 for being accepted and passing. Comparing Table 18 with Table 12 we note a marked change in equivalent quota scores that favours the state school students.

This procedure makes much more sense than the balloting procedure proposed in some quarters and adopted in Holland. In the decision theoretical model, applicants are selected because of their social and educational value and their probability of success and not because their names were pulled out of a hat. As Novick and Ellis (1977) put it "statistical decision theory provides a framework for balancing the social costs of selecting those who are less qualified at a given moment with the social gain from equalizing opportunity (p318)".

The selection procedure used by the Faculty of Medicine at the University of Newcastle could also be implemented through a decision theoretical model. The selection quota could be split into two sub-quotas as before and the students selected for the first sub-quota on the basis of quota scores as before. If the numbers for sub-quotas were chosen so that the cut-off for the first sub-quota was about 25 points (in Victorian quota score terms) above the usual cut-off, no students would be unfairly excluded because of school background. The second sub-quota could be filled to maximise expected utility. Utility points could be assigned on the basis of background characteristics associated with disadvantage and positive characteristics deemed desirable for practicing doctors. These utilities could then be combined with the probability of success given the applicants' quota scores using Equation 5 above, and the resulting utility ratings used to rank applicants for the second sub-quota.

Catholic School Students

The regression analyses for catholic school students have not been discussed in detail here. Generally, the regression lines for catholic school students fall between the regression lines for the state and independent school students. There are most probably larger differences in the quality of schools within the catholic sector than within either the independent or state sectors. However, when taken as a group, the catholic schools fall between the two other sectors on measures of disadvantage and this is in accord with the regression results for the catholic school students.

Conclusion

This study has shown that HSC scores are biased against state school students when used to select entrants to Melbourne University. It has major implications for educational policy related to the transition of high school students to universities. It shows that part of the socio-economic imbalance in the university student population is directly attributable to bias in HSC results. Thus fair selection procedures cannot be instituted unless school backgound is taken into account.

References

Carnegie council on policy studies in education, Selective admissions in higher education, San Fancisco:Jossey-Bass, 1977

Cronbach, L.J. Equity in selection-Where psychometrics and political philosophy meet.J.E.M.,13,1,1976,31-41

Darlington, R.D. Another look at "culture fairness", J.E.M., 8, 1971, 71-82

Dawes, R. M. and Corrigan, B. Linear models in decision making, Psychological Bulletin, 1974, 81, 95-106.

Dunn, T. Some statistical considerations in selection procedures, unpublished manuscript, C.S.H.E., University of Melbourne, 1977

Finch,P. Some statistical comments on educational issues in tertiary selection, Vestes, 20,4,1977,33-39

Gross, A.L. and Su, W. Defining a "fair" or "unbiased" selection model: A question of utilities, J. of Appl. Psych., 60, 1975, 345-357

Interim Committee for the Australian Schools Commission, Equality of Opportunity, in D'Urso, S. and Smith R.A. (eds.) Changes, Issues and Prospects in Autralian Education, U. of Queensland Press, St. Lucia, 1978.

Johnson, P.O. and Neyman, J. Tests of certain linear hypotheses and their application to educational problems, Statist. Res. Mem., 1936, 1, 57-93

Lee Dow, K. et al. The social composition of students entering the University of Melbourne in 1969 and 1970, in Sellick, R.J.W. (ed), Melbourne Studies in Education, Melbourne:Melb. Uni. Press, 1972

Linn, R.L. Fair test use in selection, Rev. of Ed. Res., 43, 1973, 139-161

Linn, R.L. Test bias and the prediction of grades in law school, J. of Legal Education,27,1975,293-323

Linn, R.L. In search of fair selection procedures, J.E.M.,13,1,1976,53-58

Lord, F.M. Further problems in the measurement of growth, Educational and Psychological Measurement, 18, 1958, 437-451.

Lord, F.M. and Novick, M.R. Statistical theories of mental test scores, Reading:Addison Wesley, 1968

Novick, M.R. and Ellis, D.D. Equal opportunity in educational and employment selection, Am. Psych., May, 1977, 306-320

Petersen, N.S. and Novick, M.R. An evaluation of some models for culture-fair selection, J.E.M.,13,1,1976,3-29

Pothoff, R. On the Johnson-Neyman technique and some extensions thereof, Psychometrika, 29, 3, 1964, 241-256

Potter, O.E. University admissions policy, H.E.A.R.U. Notes on Higher Education, Monash University, 11,1976,1-4

Seashore, H.G. Women are more predictable than men,J. Counseling Psych, 9, 1962, 261-266

Silverberg, K. No choice is good, The Secondary Teacher, 193, 1974,12-14

Slamowicz, R.F., Smurthwaite, A. and West, L.H.T. Trends and biases in university entrants: Monash 1970-1975, Vestes, 19, 2,1976, 16-20

Slim, W. The education of Australians, in McKeown, P.J. and Hone, B.W. The Independent School, Melbourne: Oxford University Press, 1967

Smurthwaite, A. Selection of entrants to university, H.E.A.R.U. Notes on Higher Education, Monash University, 11, 1976,4-6

Thorndike, R.L. Letter to the A.P.A. committee on psychological tests and assessments, September 4, 1974

Von Neuman, J. and Morgenstern, O. Theory of games and economic behavior, Princeton:Princeton University Press, 1947

West, L. Letter to the editor, Vestes, 21,1,1978,26

West, L.H.T. and Slamowicz, R.F. the invalidity of the HSC as a tertiary selection device, Vestes, 19,2,1976,8-11

Wieringen, A van. Admission to higher education in the Netherlands, O.E.C.D. Directorate for social affairs, manpower and education, 26th July, 1976

Williams, T. and McDonnell, P. Public and private: school system effects on social and economic attainments in Australia, paper presented at the annual conference, Aust. Assoc for Research e in Education, Canberra, 1977

Youatt, J.B. and Nunn, E.K. Letter to the editor, Vestes, 21, 2, 1978, 55-56.

GIRLS, SCHOOL AND WORK: TECHNOLOGICAL CHANGE AND FEMALE ENTRY INTO NON-TRADITIONAL WORK AREAS

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The period 1975-1980 has not been a good one for western capitalist societies; O.E.C.D. figures have shown unemployment rates constantly rising and the period may well go down in history as the worst economic recession since the Depression of the 1920's and 1930's. In Australia, a society not used to a large pool of surplus labour, unemployment has now reached 450,000 with approximately 6.5% of the registered workforce seeking work. These figures are of course for the registered unemployed only and must be treated with caution, especially as recent studies indicate that the real rate of unemployment in the community may be a lot higher than the official statistics (Australian Bureau of Statistics and Commonwealth Employment Service) indicate. A study of Turkish, Lebanese and Australian youth found for example, that only 70% of those currently unemployed were officially registered and receiving benefits (Young *et al*, 1980). Other estimates have been made that at least 20% of under 25 year olds do not register, with young girls apparently being less willing than boys. At the time of writing approximately 1 in 5 schoolleavers will not find employment and a recent survey in an industrial town has shown that 39% of young women and 22% of young men were out-of-work (Jakubowitz, *et al*, 1980).

What is better known is that unemployment effects certain groups and sectors of society more so than others. It is known (Windshuttle, 1980) that unemployment rates vary according to geographical locale, age (youth being most affected), skill (the unskilled and semi-skilled being hit hardest) race and ethnicity (with Aborigines and non-English speaking migrants experiencing most difficulties) and lastly sex — unemployment rates being higher for women, especially young women and it is this group that is the concern of this paper.

Unemployment rates for women have always been higher than the national average, in 1979 ABS figures show the male jobless rate varied from 6.1% (January) to 4.5% (November), whilst for women it went from 9.1% (February) to 7.4% (November). The figures however are significantly higher for young females, with the 15-19 year old group constituting over 20% of the registered unemployed (ABS). This national figure, like all aggregates, conceals significant regional variation with some areas having rates of female youth unemployment approaching one-third of total registrations. One such area is the Newcastle and Lower Hunter district, where over one half (51%) of the registered unemployed are juniors whilst 32% of the total are females ageed between 15 and 19. (March 1980) Figures for the Hunter region (February 1980) show female unemployment rates have increased by a staggering 22% over the last two years and that there were only 7 positions available (i.e. suitable jobs) for the 4138 unemployed young women — a ratio of 591:1 (December 1979). Admittedly not all job vacancies reach or are registered with the CES but the general picture seems quite clear, it is women, especially young female school leavers, that are rapidly becoming a major socially and economically disadvantaged group in western societies. It is a central theme of this paper that unless young girls broaden their occupational and career horizons and enter types of work that have hitherto been seen as largely out-of-bounds and exclusively or predominantly male, then they will be increasingly relegated to a life of intermittent employment and/or domesticity. The effect of technological change and innovation on employment opportunities generally is not known but it does appear, and it will be argued here, that such changes are effecting and will effect 'women's work' significantly and disproportionately

and hence there is a greater need for women to enter those areas where employment prospects are more promising. In many cases such employment areas are those that have a large proportion of male workers, and/or require skills and qualifications that females are unlikely to possess. This paper therefore consists of 3 sections: Firstly, the effects of technological change on 'women's work' will be considered; secondly the part that schools play as agencies of sex role socialization channelling occupational aspirations will be noted, with particular reference being made to developments in career education and vocational guidance; finally and more briefly, there is a discussion of some of the difficulties and problems that young girls face on entering the 'world of men's work' with particular reference to female apprentices.

1. Women, Employment and Technological Change.

In Australia women now constitute 35% of the total labour force. What such a figure conceals however is the fact that this post-war expansion has not occurred evenly across the full spectrum of occupations. Women workers are concentrated in a limited number of occupations, often those requiring least skill, education and training, securing low rates of remuneration and enjoying limited status or standing in the community. It is not our purpose to examine in any detail women's position in the Australian workforce as this has been well summarized elsewhere (e.g. see Power 1975; 1980 a), b), Owen and Shaw, 1979). What is necessary to briefly outline, however, is what has been referred to as the occupational segregation or the sex-typing of the labour market, whereby some occupations are seen as predominantly male whilst others as predominantly female. This appears to be a feature of all industrial societies so that there effectively develops two different and relatively non-competing labour markets. An O.E.C.D. report has stated that "most women are concentrated in a small range of traditional female occupations in which they constitute almost the entire labour force" (1979 p.29), and what's more this situation has remained relatively unchanged over the last 70 years (Hakim, 1979) and if anything "women are becoming even more concentrated, particularly in the traditional female areas such as the services, retail trade and finance and insurance (where there is a substantial need for clerical occupations)" (O.E.C.D. 1979 p.29). This occupational segregation has been documented by Selby-Smith (1979) where she shows, using ABS Labour Force figures, the extent of such segregation or sex-typing for the Australian labour market.

It appears as the O.E.C.D. report implies that females, despite apparent advances in equal opportunity and anti-discrimination legislation, and despite significant discussion of schooling and sexism, are still entering a very restricted range of occupations. In 1977 (the latest date available for detailed information) over 85% of female workers were concentrated in 18 of the 61 occupations listed by the Australian Statistician (Myers 1980 Vol. I. p.103, Selby-Smith 1979, p.49). Labour force figures for August 1979 show that 63% of women were employed in clerical, service and sales jobs and that approximately 50% of all women in paid employment were found in only 9 occupations, whereas for employed men the corresponding figure was 41. Similarly nearly 2/3rds of women are concentrated in the 3 occupational groupings mentioned above, whereas the figure for employed males is 1/5th or 20%.

Clearly whatever figures are used, the Australian labour market, like its western counterparts, is distinctly segregated. That the education system must in part be held responsible for and indeed crucial in order to change such occupational segregation will be a central theme to be discussed. What is also worth noting is that amongst young females job segregation is even more pronounced with approximately 2/3rds of young girls seeking work in clerical and sales work (Power 1980 b p.508, Rubinstein, 1980 p.515), whilst in Newcastle and the Lower Hunter for example 70% of all junior unemployed females

are registered for retail work. That the labour market is divided up in such a sexually-segmented way is by now well known, what is less well known is the fact that it is these same female dominated occupations that are increasingly and disproportionately threated by technological change and the general economic recession. Employment prospects in areas such as sales, clerical, secretarial, retailing, banking — even teaching — are diminishing. It is found for example that one of the main employment avenues for tertiary educated females is in the service sector, and this sector which has absorbed so much female labour in the recent past is now generally feeling the effects of the recession. Similarly manufacturing industry, a major employer of uneducated, migrant female labour has shed 200,000 jobs over the last 5 years and the continuing demise of the textiles, clothing and footwear industry has added significantly to female unemployment. As Power (1980a and 1980b) has convincingly argued it is women, but especially young women, that are taking the brunt of unemployment. Of particular concern here however is the possible effects of technological change on 'women's work' and it is to this that we now turn.

The general relationship between employment opportunities (for both sexes) and technological change is one that cannot be readily enumerated. This very question was of central concern to the Commision of Inquiry into Technological Change in Australia (Myers Report 1980) which stated that:

"the argument is not whether jobs will disappear, which is generally conceded, but is about how many and what kinds of jobs will disappear, and to what extent they will be replaced by employment generated elsewhere in the economy and whether those who are displaced by technological change will be able to be re-employed in the newly emerging positions". (Myers 1980 Vol. I. p.27).

In other words accurate forecasts are virtually impossible, as is the problem of extricating the significance of technological change per se from that of the general economic recession. Indeed the Myers Report at times suggests that changes in employment levels in some industries may be related more to levels of economic activity than to technological innovation and that the current high rates of unemployment is not attributable to technological change but more readily explained by reference to the prevailing economic condition. At a later stage the Report states:

"Identification of the employment effects of a particular technology is extremely difficult, even with hindsight, because technological change is only one of many factors acting simultaneously to affect employment in a film, in an industry or in the economy as a whole". (Myers 1980 Vol. II, p.33).

Nevertheless despite such qualifying statements it does appear that certain occupations and industries are more 'at risk' than others, and many of these same occupations are those that are female dominated. This has perhaps been most clearly shown by Selby-Smith (1979) who is concerned with the effects of computer technology and argues that of the 18 'female' occupations[1] previously referred to:

"Six of these occupations have been identified as jobs where workers perform tasks for which computers are suitable ... In 1977 over 50 percent of the female workforce were employed in these occupations" (1979, p.50).

These 6 occupations (From the Australian Statistician) are:- Bookkeepers and Cashiers; Stenographers and Typists; Other Clerical Workers; Proprietors and Shopkeepers ... Sales Assistants; Telephone, Telegraph and Telecommunications Workers and Packers, Wrappers and Labellers. It is not that 'men's jobs'

1 'Female' occupations are those where women represent a much greater percentage of the workforce in that occupation than they do in the workforce as a whole.

will be unaffected by the introduction of, for example, computers, but that such change will affect women disproportionately. The Myer's Report itself points to the fact that the female work force was identified by a number of submissions as a group that will "bear a large burden of adjustment resulting from technological change". (1980, Vol. I p.103).

In a paper of this length it is obviously impossible to document the effects of technology on 'women's work' in any detail but perhaps the magnitude of such change can be illustrated by reference to the introduction of computerized technology in the office. In office work the two main areas of computerization and perhaps the best known, have been the introduction of Word Processors and Electronic Data Processing. A number of estimates have been made as to the impact of the computer revolution for clerical workers, the source of employment of nearly one-third of the female labour force, (e.g. see: Modern Office 1979; N.S.W. Women's Advisory Council, 1979; Rubinstein 1980; TNC Report 1978; Wighton 1979; Women's Employment Rights Campaign 1979. For case studies see Modern Office, 1976; Rydges Journal, 1978; TAFE Quarterly, 1979, and Underwood 1977). Electronic data processing it is claimed, has the potential of processing up to 15% of all office work (the equivalent of around 220,000 jobs in Australia), whilst word processors have been conservatively estimated as being able to do the work of 3 to 4 typists. Hence to quote the W.E.R.C. report "With electronic data processing actively handling the accounting tasks, and the word processor handling the majority of typing, it is now possible to cut office staff by 30% to 50%". (1979, p.21). Our knowledge concerning the employment consequences of the introduction of such computer technology is indeed scanty and it is again necessary to examine the Myer's Report which did attempt to enquire into the effects, of, inter alia, word processors.

The Myers Committee comissioned a number of reports or case studies into certain areas one of which was into word processors. In line with the earlier quotations from the Report, it was reluctant to give a precise estimate of the job-reduction potential of word processors, mentioning the difficulty if not impossibility, of extricating the technological effects from others, such as office reorganization, the changed volume of business or the general economic climate. It felt that the job displacement effect had been exaggerated but did conclude that there "is clearly a net decline in typing/secretarial positions due to the introduction of word processors" (1980, Vol. I p.51). The Report also quoted with approval a Department of Employment and Youth Affairs publication which stated that it "expects that the average displacement ratio which should occur in practice is that 2.5 to 3 typist/secretarial positions will be replaced by one word processor operator or administrative secretarial position" (Quoted on p.52 Vol. I). Similarly a study commissioned by the Report projected that between 1981 and 1985 approximately 68,000 word processor keyboards would be introduced in Australia. Despite qualifying statements the Report finds it necessary to conclude that on the whole "slow growth in new typing positions is foreseen as well as jobless growth in some areas" (Vol. I, p.57). At a later stage, remarking that typing is a female dominated occupation, the Report states that it is one "that is facing significant change as a consequence of the introduction of new technology. This technology includes such features as word processors, more and better photocopiers and facsimile, micrographic recording and retrieval equipment" (Vol. Ip.108). The Report also notes, and of particular relevance here, that typing is a youthful occupation with approximately 56% of all workers being under 30. It is also perhaps relevant at this juncture to note that technological change has not lead to massive redundancies and lay-offs in industry generally, but rather operates by means of what is rather benignly called 'natural wastage' (or silent-firing, jobless growth or not-firing-but-not-hiring). It is then the future workers, the school leavers of today that are being

most affected, "especially in a period when new entrants to the workforce are confronted with higher than average levels of unemployment". (Vol. I p.30).

By reference to one particular area, namely typing and secretarial work, but bearing in mind that 6 of the 18 'female occupations' are most amenable to the introduction of computer technology (Selby-Smith 1979), it has been our concern to demonstrate the possible effects of technological innovation for women workers generally, but particularly on young girls. It is easy to concur with the conclusion of the Myer's Report when it states: "In summary, then, the adverse employment effects of technological change tend to fall disproportionately on particular groups in the community (women, the young, immigrants and the aged) and the beneficial effects are best able to be enjoyed by other groups (the more highly educated, the more mobile, adaptive and retrainable workers)". (1980, Vol. I p.107).

2. Girls, School and Occupational Aspirations

That career aspirations of girls are limited to a narrow range of occupations has been well documented in Australia (Branson and Miller, 1979; Knight, 1977; Russell and Smith 1979; Schools Commission 1975; Sinclair et al 1977). Schools, in the advanced societies, have generally been seen as playing a significant function here as agents of sex role socialization, transmitting the dominant ideology and teaching children, both formally and informally, culturally appropriate notions of masculinity and femininity. Sociologists, amongst others, have argued that schooling in capitalist societies institutionalizes the dominant female gender role (for example see: Byrne 1978; Deem 1978; N.S.W. Department of Education 1978; Frazier and Sadker 1973; Schools Commission 1975; Sharpe 1976). Wolpe is representative of such theorists when she argues:

"notwithstanding the prevailing ideology that egalitarianism of opportunity exists for both boys and girls alike their educational experience results in marked differences in their respective level of attainment and range of subjects passed in qualifying examinations. In any event, by this time girls have come to limit their own occupational and educational horizons. Their aspirations about their future employment and the realization of these aspirations for the vast majority of girls does not go beyond the scope of what are regarded as 'suitable' feminine jobs. And to this extent the curricula that girls pursue is appropriate both to their occupational roles in the labour market as well as their roles as wives and mothers". (1974 p.140).

It is not our purpose here to summarize or critically evaluate such claims but rather, with regard to our concern with technology and its effects on 'suitable' feminine jobs, to examine selective attempts made within Australian schools to encourage girls to broaden their occupational and career horizons. Girls are disadvantaged not only by their level of education compared with boys, but also by their concentration on subjects that are not technically or scientifically oriented. The Myers Report has documented this situation well using ABS figures, stating that "more than 25% of boys satisfied tertiary entry requirements with 2 mathematics, physics and chemistry, but only 6% of girls did so; about 45% of boys did so with at least general mathematics, compared with less than 20% of girls". (1980 Vol. I p.90). Similarly of those holding trade certificates "men outnumber females by 13 to 1 (and within the female group hairdressing predominates), 24 times more females than males hold typing, secretarial studies and data processing certificates, and in the engineering and administration groups, 9 times as many males hold technical level qualifications as females" (1980 Vol. I p.91). It is therefore essential some argue, to change such a situation if girls are to be prepared for the kinds of jobs that the new technology is creating, and to encourage them to enter traditional male-domains to compensate for the number of

'feminine' jobs that the new technology is eliminating. Only by initiating such a two-pronged attack will the present disadvantaged position of young female school leavers be partially alleviated. Of course such changes in career education and vocational guidance will not in themselves create jobs — the most simple means of overcoming high rates of youth unemployment is to embark on a job-creation programme — but they may help prevent the situation whereby it is the young female school leaver who is bearing and will increasingly bear the brunt of the present technological and economic change.

It is difficult to give a precise account of what vocational guidance and career education mean in Australia (Morgan, 1979) but certainly from around the mid '70's all education systems have introduced schemes and programmes to broaden female occupational horizons, to combat sexism in education and more recently to facilitate the transition from school to work. The former have been well documented by d'Alpuget (1979) who was asked by the Schools Commission to report on the progress of non-sexist education generally throughout Australia. D'Alpuget gives a number of examples of the kinds of projects and schemes that have been introduced, including compulsory subjects for both sexes, careers seminars for girls, specially designed vocational education courses and the use of role models to encourage others by example. It is not necessary here to outline in any detail such schemes but mention is made of 2 projects that have tried to encourage more girls to enter non-traditional work domains, such as the apprenticed trades.

In South Australia 'The Pilot Project for Women in Apprenticeships' was an attempt to simply provide girls with basic information about apprenticeships in non-traditional work areas, involving group discussion and visits to various firms and factories. Similarly information was given on how to write job application forms and how to act in a job interview situation. Copies of application forms were obtained and the girls were instructed, using information gained from apprentice training officers, how best to complete the forms. Lastly mock interviews were devised where the girls were asked why they wanted to enter such non-traditional apprenticeships (MacLeod, 1978). The S.A. Education department has also developed a register of women in non-traditional occupations as part of its Career Education Project. The register is to be used by school counsellors, career education teachers and schoolgirls and of the many women contacted 60 have been included in the publication. As Gliding states "the publication attempts to give a realistic cross-section of occupations and of attitudes among the women holding these occupations. It also provides a number of role-models of successful working women to help counteract the lowering of aspiration that occurs among females during secondary schooling" (1978 p.39). It is essential if girls are to enter such work areas for them to have concrete examples of women who have 'made it', it is not enough, it's suggested, to simply state girls can do what they like.

In N.S.W. there have been similar attempts to broaden female occupational and career horizons. The SPAN Programme (Start Planning Act Now) developed by the Vocational Guidance Services to be used in schools was an attempt, to overcome firstly the sex bias of so-much guidance and advice (Sweet 1975) and secondly the fact that girls were less likely to use the available vocational services. The general aim of the SPAN programme was to encourage thinking about career planning and to provide support for self-exploration, broadening of career horizons, career exploration and decision-making and the thorough exploration of alternatives (Jones 1978). Of particular importance was to provide something over and above that already available from existing services, to increase knowledge about women, work, the life-cycle, to broaden horizons and to offer role models of women (and men) in non-traditional areas. The pilot project was implemented with 75 year 10 and year 11 girls in 7 Sydney high schools over varying

periods of time (from 3 to 8 weeks) with each group being made up of 7-11 girls. The effectiveness of the programme is not discussed in any detail but the results of a questionnaire completed by students at the end of the programme indicate its general usefulness.

The fact that projects such as these are being introduced into schools in Australia may lead us to question statements, such as Wolpe's, concerning the schools function of institutionalizing gender roles. However on closer-examination it appears the success of such schemes is partial and limited. Macleod evaluating her own project indicates that only extremely highly motivated girls will apply for apprenticeships, let alone be accepted, stating 'The results also indicate the social pressure which is placed on girls, particularly at school and by parents to move into traditionally female occupations" (1978 p.6). It is fairly obvious that the school acting alone can do little to offset the socializing influence of other agencies, and perhaps none-too-surprisingly school-based attempts to eliminate sexism have "had little impact on career choice and the majority of girls still favour preparation for only a limited number of occupations, predominantly clerical work, retail trade employment, nursing and teaching" (Swan 1979 p.22). The success of these schemes is however difficult to gauge accurately. In the past girls have often received biased advice, careers advisers often having their own views about what sorts of occupations are suitable or appropriate for girls. More recently a survey has shown that despite attempts to broaden occupational horizons, the majority of career advisers had used the specially prepared materials (e.g. 'Girls in Trades' pamphlets) only with those girls who had asked for them! The Public Service Board (N.S.W.) questionnaire showed that career advisers tended to be passive and to not fully explain the labour market to girls, or stress the importance of doing maths and science subjects so as not to be excluded from the new occupations that technological changes are creating, (quoted in Sydney Morning Herald 25.8.80). It is essential for career advisers to recognize the consequences of subject choices and to clarify the situation to girls and their parents as early as Year 7. These and other issues raised in this section will be more fully developed in the conclusion.

3. Working in a 'Man's World'

Some girls have succeeded in entering male dominated areas such as business and industrial management, the scientific and technical spheres and the skilled trades. The features that seem to distinguish such female workers are those of high motivation and perseverance. For women to succeed in these work areas such traits are crucial. Of all non-traditional areas perhaps the skilled trades are seen as more male than most, certainly as previously noted, the numbers of girls possessing trade qualifications is very low and excluding hairdressing constitute less than 1% of total apprentices in Australia. Some apprenticed trades (e.g. horticulture, printing, optical mechanics) have a greater number of females than others (e.g. boilermaking, electronics and pattern making) but all such apprentices experience a number of problems and it is to these that we now turn.

There has been very little research carried out into female apprentices and our knowledge of the problem which girls face is therefore limited. What does appear to be the main problem however is securing an apprenticeship in the first place. Employers for a number of reasons are still somewhat reluctant to take on girls, in some cases even if no suitable male candidates are available. Calvert in her interviews with 25 employers found that just over half would not take girl apprentices for a variety of reasons, including straightforward prejudice; the belief that girls would soon marry, have children and thus be lost to the trade; that they would upset the men workers; that there were no on-site facilities (e.g. toilets and showers); that they would have to be protected from the rough males and their

bad language; that the work was too heavy and dirty; that there were weight-lifing regulations; and that sexual problems may develop if not with the male workers then with the worker's wives (Calvert 1979 Chpt. 4). Without doubt this seems to be the major problem for young girls wishing to enter the skilled trades, but once apprenticed it appears that females are soon accepted and other problems experienced are often minor and insignificant.

The fact that female apprentices are still few in number and girls may find they are the only female on the shopfloor or at technical college can also prove to be a problem. Such isolation may preclude the social and moral support needed to effectively make the transition from school to work. Girls need to see other girls doing the same kind of work and hence problems experienced can be freely discussed and overcome. This is of crucial importance because of the need to offset and counterbalance the sexist portrayal of many trades as unfeminine. Young female apprentices will feel vulnerable, may often be physically isolated from other women and possibly interpret their work environment as hostile and unwelcome. However Calvert's small scale research has shown that most girls are willingly accepted by their male workmates, and that approximately 2/3rds of the girls interviewed (16 out of 22) experienced no particular difficulties because of their sex. Of those girls who did talk about problems they spoke of those at the technical college and trade school rather than at the workplace. As 'deviants' the girls were initially teased by their work colleagues but were soon accepted and treated as 'one of the boys'. Admittedly some men thought it improper for girls to usurp their 'rightful place' but such men constituted a minority and most male workers readily accepted them as long as they could do the job properly and 'held their own'. The weight problem was sometimes raised by the girls but most stressed that male apprentices also required help with these tasks, and they were not made to feel uncomfortable or inferior where such assistance was sought. Generally much fewer work problems were experienced than anticipated and we can concur with Calvert when she concludes:

"it appeared that the majority of girls were coping competently with their allotted tasks, did not find their work beyond their physical strength, got on well with their work mates and all in all formed a group of very satisfied and productive workers" (1979 p.176).

Conclusion

The conclusions to be drawn from the main themes of this paper are essentially pessimistic. Technological innovation and economic recession is significantly affecting 'women's work' and there is an urgent need for girls to broaden their occupational horizons or be relegated to a life of intermittent employment and/or involuntary domesticity. The evidence available regarding the effects of non-sexist education programmes and developments in career education and vocational guidance lead to similar conclusions; few girls are entering non-traditional work areas and perhaps more importantly schools girls are making ill-advised subject choices. It should be stressed however that even with the best possible advice and guidance, the general structural problem of a shortage of jobs will not be overcome. By paying particular attention to the position of young girls it is acknowledged that what's being discussed is the distribution and redistribution of existing jobs in a shrinking job market, and that the analysis does not in anyway attribute the present 'unemployment problem' to the education system.

Such pessimism should not mean that efforts to change the present situation should cease and in conclusion a number of suggestions are made as to what kinds of changes need to be introduced. Firstly, schools have an important part to play in ensuring that girls have an adequate basic education in mathematics and science-based subjects to enable them to participate in the newly emerging technological

occupations and thus prevent further segmentation of the workforce. Of interest here are recent demands for a core curriculum for all schoolchildren (which would include science, technical education, languages, English, maths, social education and education for parenthood), compensatory programmes for girls in maths and special allowances made for females wishing to enter areas, like the skilled trades but who have the wrong qualifications. Recent research has also claimed that in single-sex schools there is less polarization of subject choice and that girls (not boys) do less well academically in mixed schools where they are often more concerned with popularity than with school success. (Blackstone and Weinreich, 1980, Byrne 1978, Deem 1978).

Secondly changes must be made to existing career guidance programmes in schools. Career awareness needs to begin at an early age, as Russell and Smith suggest, "(it) should be made an integral part of school curricula throughout infants, primary, secondary and tertiary levels of education" (1979 p.101). Similarly it is essential that work experience schemes, link courses and other 'Transition' programmes recently introduced, make deliberate attempts to be non-sexist and to direct students to areas that may not have been freely chosen. One of the main problems of getting students to think of non-traditional work areas is the attitude of the students and their parents and in this sense schools alone perhaps, can do little to offset such sexist thinking. As has also been suggested role models (e.g. female maths teachers) and examples of girls succeeding in non-traditional areas are crucial and there is a need to publicize the success of such workers to encourage other girls and perhaps more significantly, employers.

Lastly, perhaps of greatest importance and the most resistant to change is the attitude of males towards sex roles. Girls are very slowly entering some male-dominated spheres but there is no reciprocity in the sense that men are not significantly helping with traditional feminine tasks such as child-care and housekeeping. Sexual equality in the late 1970's and early 1980's in western societies is a one-sided equality and it appears that it is easier to change attitudes towards careers than those concerning the roles of men and women in family life (d'Alpuget 1979, Russell and Smith 1979). As Vincent has aptly put it: "The ladies have been invited to join the gentlemen in their traditional labours only to find that the gentlemen do not choose to join the ladies in their traditional labours at the end of the day". (1979 p.671). Anti-discrimination and equal opportunity policies and school based programmes need therefore to be developed for both sexes in order to guarantee any success.

Such pessimistic conclusions reported here, lead to the question of how serious have these attempts to eliminate educational discrimination and sexist school practices really been? As the economic climate worsens it could be asked to what extent will the rhetoric regarding women's equality become less used, more pressing issues come to be discussed and women (especially married women), as in previous crises, increasingly become scapegoats. Scapegoats, that is for a social system that is finding it increasingly difficult to provide paid employment for all regardless of sex. The concern of this paper has been with work, technological change and how schools structure occupational choice and construct gender identity. Clearly, as was earlier intimated, it would be naive and foolish to ignore other agencies of sex role socialization and analyse the school in isolation. A complete analysis of the place of women in capitalist societies, like Australia, is beyond the scope of this paper but would need to be grounded in terms of the relationship between the education system, the means and social relations of production, social class and sex. The manner in which female identities and social roles are socially constructed and freely entered into has long been recognized by feminists and more recently by sociologists. Schools, acting alone, can do little to change such 'choice' but the relative failure of those schemes tentatively intro-

duced so far, should lead to questions being asked concerning the 'real' function of education in patriarchal, capitalist societies — societies whose continued existence appears to depend on the present sexual division of labour, a segregated workforce and an increasing proportion of the labour force willing to engage in intermittent and/or part time work. These factors should not be forgotten in any analysis of girls and their education.

REFERENCES

d'ALPUGET, B. (1979) 'Jobs for the Girls? How Careers Education Can Help? *Australian Journal of Social Issues* Vol. 14 No. 2.

BLACKSTONE, T. and WEINREICH-HASTE, H. (1980) 'Why are there so few women scientists and engineers?' *New Society* Vol. 51. 21 February.

BRANSON, J. and MILLER, D. (1979) *Class, Sex and Education in Capitalist Society* Victoria: Sorrett.

BYRNE, E. (1978) *Women and Education* London:Tavistock.

CALVERT, A. (1979) *Girls and Apprenticeships* Education Department of Victoria.

DEEM, R. (1978) *Women and Schooling* London: Routledge, Kegan and Paul.

FRAZIER, N. and SADKER, M. (1973) *Sexism in School and Society* New York, Harper and Row.

GLIDING, N. (1978) 'Register of Women in Non-Traditional Occupations' *Society for Mass Media and Resource Technical Journal* No. 3.

HAKIM, C. (1979) *Occupational Segregation* Research Paper No. 9, Department of Employment (U.K.)

JAKUBOWITZ, A., SULLIVAN, R., MILNE, J., KEENAN, E. and BECKETT, A. (1980) *Migrant Youth and Unemployment: A Preliminary Study* Centre for Multicultural Studies, University of Wollongong.

JONES, J. (1978) *The SPAN Program. Evolution, Implementation and Evaluation* Research Report. Vocational Guidance Services. N.S.W. Department of Labour and Industry.

KNIGHT, T. (1977) 'Factors affecting school leaving and work decisions for girls' in *School Leavers: Choice and Opportunity* A.G.P.S.

MACLEOD, M. (1978) *Pilot Project for Women in Apprenticeships* Women's Advisory Unit, Premier's Department South Australia.

MODERN OFFICE AND DATA MANAGEMENT July 1976 and August 1979

MORGAN, C.J. (1979) 'Career Education in Australia: Trends and Issues' *Australian Journal of Education* Vol. 23, No. 1 March.

MYERS REPORT (1980) *Technological Change in Australia.* Report of the Committee of Inquiry into Technological Change in Australia. (4 vols.) A.G.P.S.

N.S.W. DEPARTMENT OF EDUCATION (1978) *Sexism in Education: Report to the Minister* Dept. of Education.

N.S.W. WOMEN'S ADVISORY COUNCIL (1979) 'Submission to the Committee of Inquiry into Technological Change in Australia'.

O.E.C.D. (1979) *Equal Opportunities for Women* Paris O.E.C.D.

OWEN, M. and SHAW, S. (eds.) (1979) 'Working Women: Discussion Papers from the Working Women's Centre, Melbourne'. Victoria, Sisters Publishing Ltd.

POWER, M. (1975) 'Women's Work is Never Done by Men: A Socio-Economic Model of Sex-Typing in Occupations' *Journal of Industrial Relations.* September.

POWER, M. (1980 a.) 'Women and Economic Crises: the Great Depression and the Present Crisis' in Windschuttle, E. (ed.) *Women, Class and History* Melbourne, Fontana.

POWER, M. (1980 b.) 'Unemployed Women: Scapegoats of the Recession' in Crouch, C., Wheelwright, T. and Wilshire, T. (eds.) *Australia and World Capitalism* Ringwood/Penguin.

RUBINSTEIN, L. (1980) 'Women, Work and Technological Change' in Windschuttle (ed.) *op. cit.*

RUSSELL, G. and SMITH, J. (1979) 'Girls Can be Doctors ... Can't They? Sex Differences in Career Aspirations' *Australian Journal of Social Issues* Vol. 14 No. 2.

RYDGE'S (1978) *National Mutual's system cut costs, lifted quality* June.

SCHOOLS COMMISSION REPORT (1975) 'Girls, School and Society' Woden, A.C.T.: Schools Commission.

SELBY SMITH, J. (1979) 'Women, Employment and Technological Change' in Overheu, D.L. (ed.) *Computer Technology and Employment*. Seminar Proceedings, Canberra C.A.E.

SHARPE, S. (1976) *Just Like a Girl* Harmondsworth, Penguin.

SINCLAIR, K. CROUCH, B. and MILLER, J. (1977) 'Occupational Choices of Sydney Teenagers: Relationships with Sex, Social Class, Grade Level and Parent Expectations' *Australian Journal of Education* Vol. 21 No. 1.

SWAN, D. (1979) 'Education and Employment'. Report of the Australian Education Council Working Party. June.

SWEET, R. (1974) 'On Anti-Feminism in the Theory and Practice of Vocational Psychology'. Research Report, Vocational Guidance Services, N.S.W. Department of Labour and Industry.

TAFE QUARTERLY (1979) Journal of N.S.W. Department of TAFE. Winter.

T.N.C. REPORT (1978) 'The Job Killers' Trans National Co-operative Reportback No. 4.

UNDERWOOD, C. (1977) *Typewriters and Word Processing Feature* Modern Office and Data Management, February.

VINCENT, S. (1979) *New Society* (Book Reviews) 20-27 December. Vol. 50.

WIGHTON, R. (1979) *Submission of S.4. Working Party on Women and Technological Change* June.

WINDSCHUTTLE, K. (1980) *Unemployment* Ringwood, Penguin. Revised edition.

WOLPE, A.M. (1974) 'The Official Ideology of Girl's Education' in Flude, M. and Ahier, J. (eds.) *Educability, Schools and Ideology*. London, Croom Helm.

W.E.R.C. (1979) *Women and Unemployment*. Women's Employment Rights Campaign, Chippendale, Panacea Press.

YOUNG, C., BETTY, M. and FAULKNER, A. (1980) *Education and Employment of Turkish and Lebanese Youth* A.G.P.S.

THE RELATIONSHIP BETWEEN PSYCHOLOGICAL DIFFERENTIATION AND QUESTIONING BEHAVIOUR OF TEACHER TRAINEES

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Undoubtedly, having a good questioning technique is a skill that most teacher-trainees would like to acquire. One aspect of questioning is the cognitive level associated with the thought process initiated by a question. When the questioner's purpose is to assess how much a pupil has learned, the question is usually associated with a particular instructional objective. Educational objectives have been classified by Bloom *et al* (1956) and others into heirarchies. Objectives in the cognitive domain, and questions associated with them may therefore be identified with levels of cognitive operation. Questions associated with the lower levels of a taxonomy of educational objectives may be referred to as "lower-order questions", while those corresponding to higher levels may be described as being "higher-order".

The effects of these different types of questions have been investigated by a number of researchers. Gall (1970) and Crump (1970) suggest that higher-order questions help to develop critical thinking in pupils. Findings reported by Beseda (1973) and Cohen (1973) indicate, on the other hand, that there is little or no relationship between higher-order questioning and the development of critical thinking.

Educationists such as Houston (1938), Borg *et al* (1970) and Crump (1970) have made attempts to improve teachers' questioning behaviour by training them to increase the proportion of higher-order questions asked in the classroom. Such attempts have met with different degrees of success. Despite attention paid to questioning techniques during the training of teachers, there exists abundant evidence to suggest that the use of lower-order questions in the classroom has continued to predominate.

This persistence of low-order questioning, in spite of attempts to reduce it, has led to the suggestion that questioning behaviour may be related to a deep-rooted psychological trait which is not particularly amenable to change. Such a trait is cognitive style, which is a function of one's degree of psychological differentiation. An individual's cognitive style is his characteristic and self-consistent mode of approach to perceptional and intellectual activities.

A number of cognitive styles have been identified by different authors. The one addressed in this paper is that identified by Witkin *et al* (1962) and which is represented by a normally distributed variable with field-dependence at one extreme and field-independence at the other. According to Witkin and his co-workers, field-independent people are characterised by the ability to analyse and structure the components of a stimulus complex; they are often said to have an analytic cognitive style. Relatively field-dependent individuals, on the other hand, are less able to analyse or structure the stimulus complex and therefore tend to respond to the stimulus or situation as a whole; they have a global field approach.

Cognitive style has been shown to be related to teaching style (Wu, 1968), learning style (Grieve and Davis, 1971) and problem-solving (Guetzkow, 1951; Ohnmacht, 1966). A problem-solving situation of interest in this study is the construction of questions for the evaluation of pupil learning. The under-

lying connection between cognitive style and questioning behaviour is the extent to which a given questioning-behaviour pattern, as related to Bloom's taxonomy (Bloom *et al*, 1956), calls for the particular cognitive skills involved in a given global or analytical style.

Some mental processes (or behavioural aspects of educational objectives) such as application, analysis, synthesis and evaluation, identified by Bloom *et al* (1956), appear to be more compatible with the cognitive functioning of the field-independent cognitive style. On the other hand, the mental processes of memory (knowledge) and comprehension appear to be more congenial to the cognitive characteristics of the field-dependent style. This study was designed to investigate the hypothesis that field-independent primary teacher-trainees set a greater proportion of higher-order questions than their field-dependent colleagues when assessing pupil-learning.

Method

Seventy-nine volunteer primary teacher-trainees were used in the study. Thurstone's *Concealed Figures Test (Closure Flexibility)* was used to measure extent of psychological differentiation. This instrument has a high correlation with Witkin's *Embedded Figures Test*, and is often used for measuring field-dependence. Subjects whose scores were in the top third of the distribution were designated field-independent, those being in the bottom third forming the field-dependent group.

Subjects in these extreme groups then read a text-book passage on Danish agriculture and industry, and were asked to imagine that they were planning a lesson based on the material in the passage. Each subject was then requested to write down ten questions designed to assess how much the pupils in his class would have learned as a result of participating in the lesson.

Each question was classified by five trained judges into one of the six major categories in Bloom's taxonomy (cognitive domain). A question was defined as higher-order if three or more judges classed it as belonging to the Application, Analysis, Synthesis or Evaluation categories.

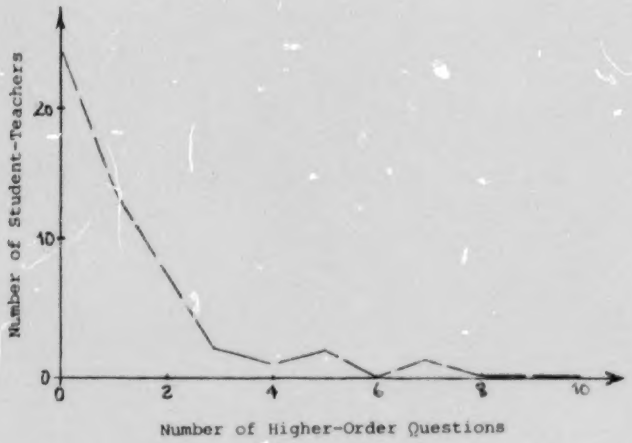
Results

The number of lower-order and higher-order questions set by the respective groups is indicated in the contingency table presented below.

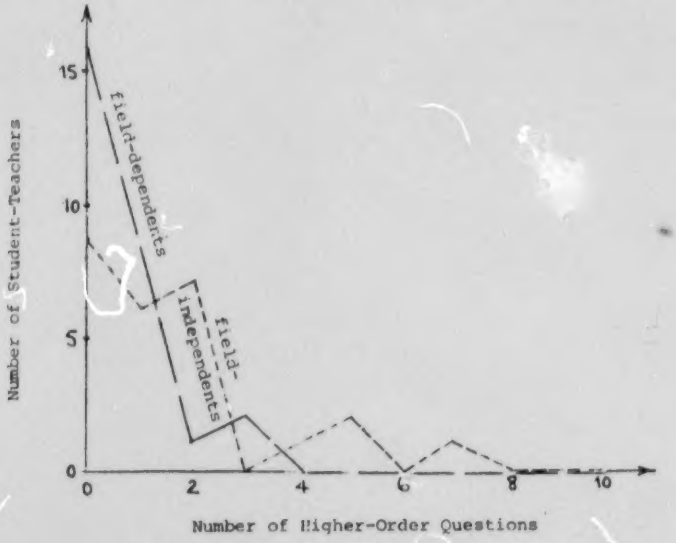
		Group		
		Field independent	Field-dependent	
Type of question	Higher -order	41	16	57
	Lower -order	219	244	463
		260	260	520

The proportions of higher-order questions set by the field-independent group was 15.8%, that set by the field-dependent group being 6.2%. According to the normal approximation of a two-tailed Fisher's Exact Test, these proportions are significantly different ($z = 3.50$, $P = 0.00046$).

The proportion of higher order questions set by both groups combined was about 11%, nearly half the subjects setting no higher-order questions, a further quarter setting only one. The frequency polygon presented below shows the number of student teachers who set each possible number of higher-order questions.



Separate frequency polygons for the respective groups are presented below.



It is observed that, as expected, questions set by field-independent trainees show a wider spread, ranging from zero to seven higher-order questions out of ten.

Discussion

The results of the study confirm the findings of Crump (1970) and the observation by Gall (1970) that questions used by teachers and teacher-trainees in the classrooms are predominantly lower-order in nature. This feature in classroom questioning gives a positively skewed distribution of questions set by

teachers, especially at the elementary school level.

An earlier study, reported by Witkin (1973), indicated that elementary school teaching attracts relatively field-dependent subjects. These findings, together with the results of the present study, offer plausible explanation for the predominance of the use of lower-order questions in the schools, especially at the elementary level.

The finding that field-independent elementary teacher-trainees tend to set a greater proportion of higher-order questions than their field-dependent peers is consistent with Witkinian theory. Because elementary teacher-trainees have a tendency towards field-dependence, it seems probable that the degree of field-independence in the so-called field-independent group is lower than the degree of field-dependence in the other extreme group. The effect size found in this study, is therefore somewhat depressed by the use of elementary teacher-trainees.

The results of the study suggest a different approach to the problem of improving questioning behaviour in teachers and teacher-trainees. Many of the conventional methods of improving questioning behaviour are analytical in nature. Since field-dependent individuals are not analytical in their approach to situations and since they constitute the greater percentage of people whose questioning behaviour needs to be changed or improved, it is suggested that methods which are more compatible with the characteristics of field-dependence be used with such persons.

REFERENCES

Beseda, C.G. Levels of questioning used by student teachers and its effect on pupils' achievement and critical thinking ability. Ph.D. Thesis, Northern Texas State University (1972). Dissertation Abstracts International, 32-A, 4214, 1973.

Bloom, B.S. (Ed.) Taxonomy of Educational Objectives; Cognitive Domain. New York: David McKay Co. 1956.

Borg, W.R., Kelley, M.L., Langer, P. and Gall, M. The Minicourse: A Microteaching Approach to Teacher Education. California: Macmillan Educational Service, 1970.

Cohen, M.A. Teachers questioning behaviour and pupil critical thinking ability: A study of the effects of teacher-questioning behaviour on pupil critical thinking ability in three academic subjects offered in a suburban high school. Doctoral dissertation, New York University. Dissertation Abstracts International, 32-A, 6745, 1973.

Crump, C. Teachers, questions, and cognition. Educational Leadership, 27, April, 657-660, 1970.

Gall, M.D. The use of questions in teaching. Review of Educational Research. 40, Dec., 707-721, 1970.

Grieve, T.D. and Davis, J.K. The relationship of cognitive style and method of instruction to performance in 9th grade geography. Journal of Educational Research, 65, 137-141, 1971.

Guetzkow, H. An analysis of the operation of set in problem-solving behaviour. Journal of General Psychology, 45, 219-244, 1951.

Houston, V.M. Improving the quality of classroom questions and questioning. Educational Administration and Supervision, 24, 17-28, 1938.

Meckes, R.C. A study to ascertain the instructional index and questioning strategy of mathematics teachers in grade six, and to determine their relationship to professional characteristics of situational factors. Doctoral dissertation, Southern Illinois University (1971). Dissertation

Abstracts International, 32-A, 4245, 1972.

Ohnmacht, F.W. Effects of field independence and dogmatism on reversal and nonreversal shifts in concept formation. Perceptual and Motor Skills, 22, 491-497. 1966

Witkin, H.A., Dyk, R.B. Faterson, H.F., Goodenough, D.R. and Karp, S.A. Psychological Differentiation. New York: Wiley, 1962.

Witkin, H.A. The role of cognitive style in academic performance and in teacher-student relations. Research Bulletin, 73-11. Princeton: Educational Testing Service. 1973.

Wu, J-J. Cognitive Style and Task Performance - A Study of Student Teachers. Doctoral dissertation, University of Minnesota. (1967). Ann Arbor, Michigan, University of Michigan Microfilms, No. 68-7048. 1968.

IMAGERY PROCESSING IN THE VERIFICATION OF TOPOGRAPHICAL CROSS-SECTIONS

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The study and use of maps is a central component of most geography curricula. Consequently, the experimental investigation of the cognitive processes employed in the reading and interpretation of maps would seem to hold considerable potential for the design of geography instruction. The present study represents an initial attempt at such an investigation.

A review of the literature shows a dearth of studies dealing with the use of maps. Rather, the focus of research seems to have been on the cognitive encoding of spatial and environmental knowledge, and not on the cognitive processing of map representations of that knowledge. For instance, it has been found that people's knowledge of their environment seems to be organized around a small number of predominant features such as regional edges, pathways, intersectional nodes, distinctive landmarks, and districts (Solomon, 1978). Further, at least for students' knowledge of college campuses, it would seem that such knowledge organizations are essentially established within about three months (Herman, Kail & Siegel, 1979).

Wilton (1977; 1979), working with tasks requiring judgments as to whether a given town was the closest of a set to a second given town, or whether a given town was within a specified directional arc of a second given town, concluded that people's environmental knowledge may be encoded in propositional formats rather than in terms of spatial arrays. This interpretation was also found to apply to the cued recall of spatial arrangements in a laboratory acquired array task (Wilton & File, 1977).

Evidence has also been found that environmental knowledge can be encoded hierarchically. Wilton (1979) found between town direction judgments to be faster when those towns were within separate regional units. Further, Stevens and Coupe (1978) found that such judgments were reliably distorted toward the direction between the larger regional units containing each of the towns. Environmental knowledge may also tend to be encoded in informationally simpler topological terms rather than in more complex Euclidean terms. Byrne (1979) found route distances to be overestimated if the route passed through featurally varied locations, or if it included bends, and the recall of street corner angles to be reliably distorted toward ninety degrees.

However, as already noted, each of these findings essentially relates to the manner in which environmental knowledge is memorially encoded. They do not directly bear on the cognitive processes employed when a person reads and interprets a map. Intuitively, the reading and interpreting of a map would seem to involve, at least at some stage, the manipulation of spatial information represented as mental images. In the more general cognitive processes literature there are a number of studies dealing with the manipulation of mental images; their findings being of possible applicability to map use.

Cooper and Shepard (1973) had subjects make identification responses on rotated and mirror reflected alphanumeric symbols. Their data were interpreted in terms of subjects having formed and mentally rotated mental image representations of the symbols. This basic interpretation was later extended to apply also to comparison judgments made on random shapes which were rotated relative to other criterion shapes (Cooper & Podgorny, 1976). Such findings would suggest that people are quite capable of forming and manipulating mental image representations, at least in two dimensions.

Two other studies demonstrated that such mental image manipulation can occur in three dimensions.

Shepard and Feng (1972) gave their subjects diagrams of unfolded cubes and required them to make judgments relating to those cubes when folded back into three dimensions. A strong linear relation was found between response time and the number of cube sides that would have had to have been moved had the subjects been re-forming real unfolded cardboard cubes. Shepard and Feng interpreted this finding as evidence that their subjects had performed the task by manipulating three dimensional mental images of the presented cube diagrams.

In a second study, Pinker and Kosslyn (1978) had their subjects mentally image three dimensional arrays of objects suspended in an open-front open-top box. These subjects were then required to shift their focus of attention from object to object in their mental images, and to mentally re-arrange the objects in these images. The response times for the completion of these imaginal manipulations correlated higher with the three dimensional distances between the objects than they did with the two dimensional "photograph" distances. Consequently, Pinker and Kosslyn argued that imagery representations are capable of representing three dimensional metric information, and further that such information can be maintained across mental manipulations of those images.

In summary then, these preceding findings suggest that people are capable of performing comparisons and verifications involving shapes by forming and mentally manipulating image representations of them. Further, they also suggest that such representations and manipulations are not constrained to two dimensional space. Consequently, it would seem entirely feasible that in the reading and interpretation of maps, people might well construct mental image representations of the land forms and the spatial arrangements depicted, and make their judgments and decisions by mentally manipulating such image representations. That is, it is feasible that such could happen, but the question is does it? Can a task be designed that first, requires judgments to be made of information presented in map form, and second, allows imagery processing to be manifested? The aim of the present study was to do just that.

The task employed in the present study involved two stages. First, the subject was presented with a contour map of a simple topographical feature. This contour map had a cross-section line drawn through it at one of five orientations. When he felt that he had studied the map sufficiently, the subject signalled his readiness and he was immediately presented with a diagram of a topographical cross-section. The subject's task was to judge whether or not the presented cross-section was indeed correct for the map he had just studied. The task therefore yielded two response times, the first (RT1) measuring the time required to study the map and prepare for the judgment of the ensuing cross-section diagram, and the second (RT2) measuring the time required to actually accept or reject that cross-section. Examples of the map stimuli and cross-section diagrams used in the study are shown in Figures 1 and 2.

There would seem to be at least two strategies that could be used in performing the present task, one employing image representations and the other propositional representations. In the first, the subject could use the map to generate an imaginal representation of what the correct cross-section should look like. This representation could then be compared directly to the task cross-section when presented. If it is assumed that during map study the subject images the mapped feature in three dimensional relief, the cross-section representation could be formed by slicing through the mapped feature along the cross-section line, and then mentally manipulating that "end-on cut" into the appropriate position for the following comparison judgment. Such a strategy would predict a non-constant function between the cross-section line's orientation on the map and RT1, the simplest form of this function perhaps being for RT1 to increase with increased orientation angle (as found for instance by Cooper and Shepard, 1973, and Cooper and Podgorny, 1976).

Figure 1.

Example map stimuli showing the five cross-section line orientations used.

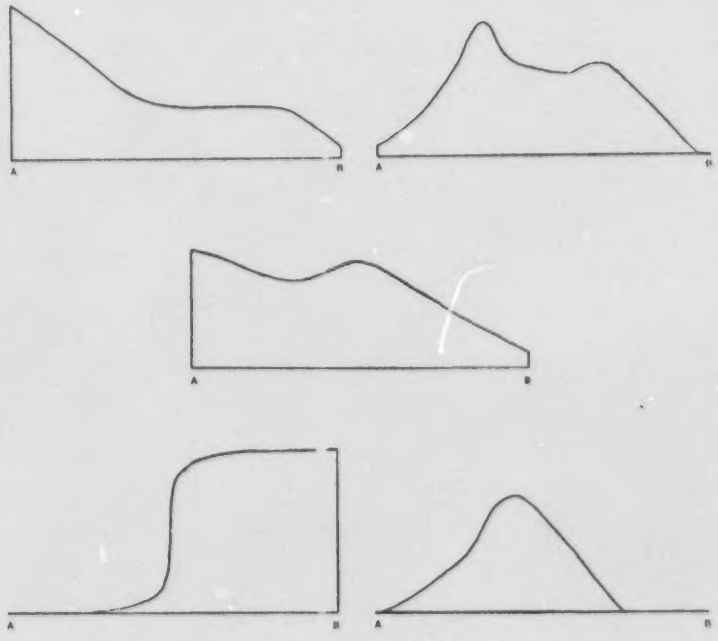

Figure 2.

Example cross-section diagrams (taken off the map stimuli shown in Figure 1).

However, such a prediction would require assumptions regarding the manipulation of the "end-on cut" that at this stage of research would have minimal evidential basis. Consequently it is sufficient to predict that the orientation versus RT1 function should simply be non-constant.

When the subject makes his judgment of the presented cross-section, an imagery strategy would predict first, that RT2 for both yes and no cases should be faster than RT1, second, that RT2 should be faster for no than yes cases, and third, that RT2 should show no influence of orientation angle. The first prediction follows from the expectation that the judgment is made by a direct comparison between a generated mental image of a cross-section and the actual presented cross-section diagram. It would seem reasonable to assume that a holistic image-to-criterion comparison should not take as long as the generation and manipulation of that image. The second prediction follows from the expectation that a no response would occur as soon as a discrepancy was noticed, but that a yes would be delayed until the subject was sure that there were no mismatches. And for the third prediction, the expectation is that once generated the mental image representation of the cross-section need retain no initial orientation information for comparison purposes, and thus would likely not do so.

The second of the two possible strategies to be considered here is based upon a non-imagery serial encoding of the cross-section's characteristics. For instance, the subject could begin at A on the map's cross-section line and scan along toward B. Every time a contour was crossed its level, together with the distance from A traversed so far, could be encoded. The subject would thus generate a serial encoding akin to a Cartesian co-ordinate specification of the cross-section's shape. Upon presentation with the criterion cross-section, the subject could again begin at A, and again scan along to B, but this time would check the serially encoded characteristics from the map against those depicted in the presented diagram. As soon as a mismatch was detected a no response would be produced, but if the scan reached B without mismatch a yes would be produced.

Of course it could be argued that few subjects might be capable of a serial encoding as detailed and exact as this, but the basic strategy of serially encoding a list of cross-section characteristics could still very well apply, even if in a simpler form. For instance, the subject might generate a series of simple jump steps such as "UP - UP - LEVEL - LEVEL - DOWN - UP ..." to describe the shift from one contour crossed to the next. The criterion comparison stage could then still proceed in characteristic by characteristic serial fashion, although it would be less precise.

Similar to the imagery strategy, this serial encoding strategy would also predict that RT2 should be faster for no than yes responses, and that RT2 should show no orientation angle effects. But in two other respects it makes different predictions. First, the encoding, once produced, would not have to be manipulated in readiness for the ensuing comparison, as would a generated image representation. A serial encoding of cross-section characteristics from A to B should therefore not be influenced by the orientation of the cross-section line. So long as the A to B distance was held constant, and the contour maps were of a standard complexity, RT1 under the serial encoding strategy should be constant across orientation angle. Second, if we assume that the time required to retrieve and compare an encoded characteristic is approximately equivalent to that required to encode that characteristic in the first place, then RT2 for yes responses should be equivalent to RT1. The making of a yes response would have been preceded by the retrieval and comparison of all of the characteristics serially encoded for a given map stimulus. Of course no responses would have been on average preceded by fewer characteristic retrievals than the number encoded and so a serial encoding strategy should still predict RT2 for no to be less than RT1.

Method

Subjects

Eighteen volunteers, 11 male and seven female, drawn from a university student population served as subjects. Each received a token payment for participation. All subjects had successfully completed two to four years of study in undergraduate level geography, and thus all were quite familiar with contour maps and cross-section diagrams, and were well practised in their use.

Materials

Fifteen contour maps, three examples of each of five different topographic features (hills, spurs, valleys, cliffs, and saddles), were each drawn by using the same four contour levels (marked as 60, 70, 80, and 90). Each map was then overlaid with each of five equal length cross-section lines (0° or horizontal, labelled A at the left and B at the right; 45°; 90° or vertical, labelled A at the top and B at the bottom; 135°; 180° or reverse horizontal, labelled A at the right and B at the left) to produce 75 distinct map stimuli for use in the experimental task. Two copies were made of each of these map stimuli.

Cross-section diagrams were drawn for each map stimulus, always with A at the left of the diagram and B at the right. Also the horizontal scale A to B on each diagram was the same as for A to B on the map. The vertical scale on the diagrams was set so that the height jump from one contour level to the next was one tenth of the horizontal distance from A to B. Two copies were made of each of the 75 diagrams, and these were then paired with the map stimuli to produce 75 correct and 75 wrong map-diagram pairings. For the wrong pairings only diagrams that were clearly wrong were used. So for instance a map stimulus for which the correct diagram was a hill might be paired with a valley, or a diagram sloping up left to right might be swapped for an upward slope right to left.

Five blocks of 20 map-diagram pairings were formed such that each block contained two correct and two wrong pairings for each of the five cross-section orientations. Selection was random excepting that none of the original 15 maps was used more than twice per a single block, and all were used at least once in each block. Sequencing of pairings within blocks was random excepting that identical-map pairings were not juxtaposed. Ten further pairings were selected for use in preliminary training instructions.

All the map stimuli and cross-section diagrams were prepared as 110-size transparencies for presentation by rear view projection.

Procedure

Each subject was given preliminary instructions (via synchronized audio-tape and transparency projector) which explained the format of the experimental task, gave examples of the variations that would occur in both cross-section orientation and mapped feature, and concluded by giving the subject 10 practice tasks. Subjects were told that they were to try to perform each problem correctly, and as quickly as they could. This last instruction was repeated at the start of each block.

Subjects were then administered the five 20-trial blocks, the first of which was also treated as practice for analysis purposes. The order of these blocks was varied from subject to subject by cyclically counterbalancing which block was presented first, second, and so forth. There were short delays of about two or three minutes between blocks while the transparencies and audio-tapes were swapped and rewound.

Each trial began with the screen blank and darkened. A warning beep sounded (over headphones worn by the subject) two seconds before the presentation of the map stimulus, which the subject studied until he was ready for the criterion cross-section diagram. When ready, the subject depressed a hand held button (with preferred hand) which caused a timer to stop (yielding RT1 from map presentation) and the map

stimulus to be replaced by the cross-section diagram (which also started a second timer). The subject then indicated his judgment of the diagram by vocally saying "yes" or "no". The voice response activated a relay which stopped the second timer and yielded RT2. Following the judgment response the screen was again dark blanked, and there was a 20 second rest delay until the warning beep for the next trial.

Subjects were run individually in sessions lasting 60 to 75 minutes.

Results and Discussion

Each of the four blocks used in the analysis yielded four RT1 readings for each of the five cross-section orientations. Excepting for errored trials which were discarded, the fastest three RT1 readings for each orientation for each block were averaged, and these means were then averaged again over blocks to produce a single RT1 measure for each orientation for each subject. In similar fashion, the faster of the two RT2 readings yielded for yes and no responses separately for each orientation were averaged over blocks to produce single yes RT2 and no RT2 measures for each orientation for each subject. These measures were then entered into analyses of variance. Note that all F values were tested using the Greenhouse and Geisser procedure which avoids equal covariance assumptions in the variance-covariance matrices.

The overall error rate for the four analyzed blocks was 6.46%; for yes tasks it was 8.33% and for no it was 4.58%, this difference proving non-significant ($F(1,17)=2.54$, $p<.25$). Orientation was not significant as an effect with any of errors on yes tasks ($F(4,68)=1.70$, $p<.25$), errors on no tasks ($F(4,68)=1.94$, $p<.25$), or errors overall ($F(4,68)=2.39$, $p<.25$). Thus, the analysis of errors would seem to add little to data interpretation and is therefore not discussed further.

The means for RT1, yes RT2, and no RT2 are listed in Table 1. For RT1, orientation of cross-section line was a significant effect ($F(4,68)=8.45$, $p<.01$). Comparisons between individual orientations showed RT1 for 0° to be significantly less than that for 45° ($F(1,17)=12.45$, $p<.01$), and 135° ($F(1,17)=11.88$, $p<.01$), but not significantly different from 90° ($F(1,17)<1$), or 180° ($F(1,17)=2.10$, $p<.25$). The RT1 difference between 45° and 135° was also non-significant ($F(1,17)<1$), but those between 45° and 90° ($F(1,17)=17.18$, $p<.01$), 45° and 180° ($F(1,17)=4.78$, $p<.05$), 90° and 135° ($F(1,17)=15.27$, $p<.05$), 90° and 180° ($F(1,17)=3.26$, $p<.1$; but $t(17)=1.81$, $p<.05$ one-tailed), and 135° and 180° ($F(1,17)=8.10$, $p<.05$) each proved to be reliable. It would seem then that the appropriate interpretation of the RT1 data is that they show map processing to be slower with 45° and 135° orientations than with 0° and 90°, and of intermediate duration with 180°.

Table 1

Mean Response Times in Seconds for both Map Study and Cross-section Judgment

	Overall	Orientation of Cross-section Line				
		0°	45°	90°	135°	180°
Map Study (RT1)	5.52	5.25	5.86	5.16	5.89	5.45
Yes Judgment (RT2)	1.137	1.109	1.140	1.151	1.153	1.132
No Judgment (RT2)	.877	.861	.898	.882	.849	.896

For RT2, orientation was significant for neither yes ($F(4,68)<1$) nor no ($F(4,68)=1.29$, $p<.5$) responses, although yes responses were slower than no ($F(1,17)=42.22$, $p<.01$). Also, RT2 for yes responses was reliably faster than map study RT1 ($F(1,17)=158.23$, $p<.01$). The appropriate interpretation of the RT2 data would thus seem to be that both yes and no responses are of constant duration with respect to the

original map stimulus' cross-section orientation, that no responses are made faster than yes, but that both types of criterial judgment responses are faster than the initial preparatory processing of the map stimulus.

These findings support an interpretation that the subjects had performed the cross-section judgments by an imagery strategy and not a serial encoding strategy. While both strategies would predict the yes versus no RT2 findings, and also the RT2 constancy across orientation, that orientation was a significant effect for RT1 and that RT1 was clearly and definitely slower than yes RT2 both provide support for the imagery strategy. A serial encoding strategy would predict RT1 to be constant across orientation and yes RT2 to be overall equivalent to RT1; clearly neither of these were supported by the present findings.

Consequently, the intuitive expectation expressed earlier that the reading and interpretation of maps should involve some degree of mental imagery generation and manipulation would seem to have been borne out; at least insofar as tasks akin to the present one are concerned. Moreover, the reviewed findings from the general cognitive processes literature that people should be capable of forming and manipulating three dimensional imagery representations would seem now to be generalizable to a task of more direct curricular significance.

It is interesting to speculate on the manner in which the present subjects might have manipulated the image representation of the cross-section prior to its comparison to the criterion diagram. If they had simply rotated it back to 0° horizontal then a simple positive linear function between orientation and RT1 would have resulted. It clearly did not. Interestingly it was the diagonal orientations that took the longest times, with both 0° and 90° being the fastest. Given that the subjects were already reasonably adept geographers, perhaps the superiority of the 0° and 90° orientations might reflect a familiarity for operating with horizontal and vertical axis grid systems. That is, "geographically practised" subjects might be quite capable of doing something like mentally tilting the head 90° to the right when viewing a 90° map stimulus, and thus constructing the cross-section representation directly into the appropriate orientation for comparison. Of course even with such mental head tilting the two diagonal orientations would nevertheless require some rotation, the 45° back to horizontal and the 135° back to vertical. In that such "corrective" rotations for the diagonal orientation cases would be equivalent (45 degrees each), this hypothetical strategy would also predict RT1 for 45° and 135° to be roughly equal, as was indeed found.

The finding of an intermediate RT1 for 180° orientation cases is not readily explained by the above "head tilting" hypothesis. A corrective rotation back to either vertical or 0° horizontal would predict RT1 for 180° to be longer than that for both 45° and 135°, and such was not found. There is another alternative however. Suppose that initially the subject treated the 180° orientation as if it was set at 0°. This would mean that the constructed image representation of the cross-section would be correctly placed in the horizontal, but would be a mirror image of its correct form. Therefore, prior to criterial comparison, the subject would need to mentally flip or mirror reflect his cross-section representation, predicting that RT1 for 180° would be equal to that for 0° plus an increment for this adjustive reflection.

Admittedly the preceding discussion is very speculative. However the hypothetical strategy suggested would seem to be not inconsistent with the little relevant research evidence available. The Cooper and Shepard (1973) and Cooper and Podgorny (1976) studies reviewed earlier both found a positive increasing function between the appropriate response time and stimulus orientation, which they interpreted in terms of simple image rotation strategies. But both of these studies employed randomly selected subjects, and novel

laboratory tasks; which constitute important differences with the present study. The above suggested strategy rests heavily on an assumption that since the present subjects were geographically adept, and since the task materials were also geographic and thus not novel and arbitrary, the present subjects could quite reasonably be expected to employ already acquired processing skills in performing the present task. A logical next step in the present research would be to determine whether geographically naive subjects would exhibit performances similar to the present subjects, or in line with a positive increasing orientation versus response time function, or perhaps even indicative of a non-imagery serial encoding strategy.

In conclusion, it needs to be stated that the present study was very much an initial study, and very much of an exploratory nature. There are a great many aspects of map use that could be fruitfully subjected to cognitive research analysis; for instance the importance of the different cues that go to make up a contour map, the extent to which subjects can actually picture a map in relief, and the effectiveness of different approaches to training in interpreting maps. In that maps are an important informational tool, not only in geography and other social science curricula, but also for mundane uses such as indicating rapid transit routes, it would seem important to know something of what occurs cognitively when people use them.

References

Byrne, R.W. (1979). Memory for urban geography. Quarterly Journal of Experimental Psychology, 31, 147-154.

Cooper, L.A. & Podgorny, P. (1976). Mental transformations and visual comparison processes: Effects of complexity and similarity. Journal of Experimental Psychology: Human Perception and Performances, 2, 503-514.

Cooper, L.A. & Shepard, R.N. (1973). Chronometric studies of the rotation of mental images. In W.G. Chase (Ed.), Visual information processing. New York : Academic. Pp. 75-176.

Herman, J.F., Kail, R.V. & Siegel, A.W. (1979). Cognitive maps of a college campus: A new look at freshman orientation. Bulletin of the Psychonomic Society, 13(3), 183-186.

Pinker, S. & Kosslyn, S.M. (1978). The representation and manipulation of three-dimensional space in mental images. Journal of Mental Imagery, 2, 69-84.

Shepard, R.N. & Feng, C. (1972). A chronometric study of mental paper folding. Cognitive Psychology, 3, 228-243.

Solomon, L. (1978). Mental mapping: A classroom strategy. Journal of Geography, 77, 70-75.

Stevens, A. & Coupe, P. (1978). Distortion in judged spatial relations. Cognitive Psychology, 10, 422-437.

Wilton, R.N. (1977). Knowledge of spatial relations: The determination of the relationship "nearest to". Quarterly Journal of Experimental Psychology, 29, 685-698.

Wilton, R.N. (1979). Knowledge of spatial relations: The specification of the information used in making inferences. Quarterly Journal of Experimental Psychology, 31, 133-146.

Wilton, R.N. & File, P.E. (1977). The representation of spatial information in memory. Quarterly Journal of Experimental Psychology, 29, 383-388.

SCHOOLING AND LEARNING: KEEPING PUPILS ON TASK

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Introduction

This is an era of accountability, both fiscal and societal. Teachers and teacher educators are being viewed by their political masters through a sort of cost-benefit quizzing glass. At the same time, the schools are supposed to take up the slack in youth unemployment; so that many classes presently consist, in part or whole, of disenchanted young people who see themselves as unlikely to profit from the school's offerings, and at the same time as having very little to look forward to in the world beyond the school. The "Back to the Basics" lobby presses politically in the meantime to influence the schools and their teachers to revert to a formalism which may not seem to educators to be the most appropriate methodology with classes such as those described above.

Against such a backdrop, classroom management, always a practitioner concern, gains added importance. It is true that unless a teacher can direct his students' activities in his class in such a way that he knows for most of the time in a lesson what they are doing, and moreover that what they are doing is what he intends them to be doing, he cannot expect much in the way of worthwhile pupil output. He cannot guarantee that pupils will gain mastery in the topic being studied merely by spending a significant amount of time in his lessons engaged with tasks which he has set, but, on the other hand, if this engaged time has been very small, or even nil, he cannot reasonably expect mastery at all.

This then is the background against which the SCMP project operates. It is naturalistically observing the transactions in junior science classrooms in six Brisbane secondary schools, where a full range of problems present themselves to teachers. How the teachers react to these problems, how they organize and segment the learning activities of their pupils, how in short, they manage their classrooms is our predominant concern. The work reported here is part of the preliminary results of a long term study, which it is thought will have meaning not only for educational theorists but also for teachers.

1. Objectives

This study is part of the ongoing Science Classroom Management Project, and aims to:

1. define effective classroom management procedures that are used by secondary science teachers;
2. investigate the validity of the coding categories for pupil task involvement and teacher management procedures;
3. examine the relationships between teacher management procedures and pupil task involvement in and across lessons, and discrete segments of lessons;
4. Observe and categorize the naturally occurring lesson segments;
5. Observe teacher macro overt behaviours, categorize these, and investigate their relationships with pupil task involvement in lesson segments.

2. Theoretical Framework

The SCMP study is concerned with the teacher's ability to develop and manage an environment for effective learning. This phase of the study concentrates upon examining aspects of teacher management strategies and their relationship to pupil on-taskness. Thus the classroom is conceptualized as a manipulable behavioural system. This construct arises directly from Barker's (1968) ecological psychology, the classroom and its occupants being conceptualized as a behaviour setting. This implies that the

behaviours of the teacher and the pupils are an integral part of the unit (behaviour setting) which in turn coerces certain behaviours from its participants. The pupil in this setting responds not to the teacher, his age peers or the physical parameters of the classroom, but to a context which includes all these and more in an ongoing unified environment. As Gump (1964) observed: "his learning will be determined by the nature of the system and by his ability to utilize its potentials".

Thus settings, and, in particular, subsettings, are seen as more important determinors of social behaviour than the personality of individual teacher or pupil. Once a teacher decides upon the subsetting he will use, and the activity is begun, to a greater or a lesser extent the subsetting itself "takes over" both teacher and pupils. Particularly in highly structured subsettings, what ongoing transactions engage pupils and teacher are at least as important as who they are.

The SCMP also rests upon the work of Joseph Kounin (1970), who was able to show that important information about the classroom setting may be derived from simple frequency counts of readily observable pupil and teacher behaviours, as well as between teaching and setting variables and pupil behaviours in the elementary school. One of the aims of SCMP is to translate and extend Kounin's work to secondary science classrooms, the major concern being to identify, by naturalistic observations of science lessons, those characteristics of subsettings which maximize the task involvement of pupils.

Medley (1979), and Kounin and Sherman (1979), draw attention to the probability that the effective teacher is the one with a wide repertoire of teaching skills from which he can select a specific appropriate subset congruent with, and facilitating of, any particular classroom subsetting. In this context, appropriateness and effectiveness may be measured in terms of the number of students who are involved, and the depth of their involvement, with the task or tasks which are specific for the particular subsetting.

Berliner (1979) in the Beginning Teacher Evaluation Study (BTES) postulates a temporal measurement with which to quantify and examine teacher activity, pupil activity, and the possibility of learning something. The variables he brings forward are:

1. allocated time - a school period in our case for the lesson setting, but of varying lesser lengths for the nine subsettings we have identified;
2. engaged time which is the time the pupils spend upon a prescribed task, and
3. academic learning time, which is the time pupils are engaged with prescribed tasks at a relatively easy level of difficulty.

Berliner theorizes that the variance in his three time variables, between and within classes, is the most powerful variable, aptitude having been allowed for, to explain differential student achievement.

SCMP is presently concerned with 1 and 2 above and is concentrating on identifying and analysing teacher behaviours which are significantly related to the amount of time the pupils are engaged in the instructional task.

Empirical observation of gross or wide-scale teacher behaviours has been carried out, and the results are reported herein. This investigation will proceed to a finer grained analysis of teacher behaviours in two defined further stages, as part of the task of reliably translating the significant variables identified by Kounin in the open world of the elementary classroom to the more sophisticated, complex and covert adolescent world of the secondary science classroom. Whereas the cluster of behaviours recognized by Kounin and termed "withitness" will not be likely to consist of the same cluster of behaviours, it seems already that such a construct as withitness (the pupils believing the teacher knows

everything that goes on even before it happens) is still a potent one.

Kounin (1970) analysed group management skills and provided a useful model for studying the interaction of environment and behaviour in the classroom. The teachers in his study who were successful classroom managers, that is, that could maintain high levels of student on-taskness showed mastery in the following skill areas:

1. Withitness, or the ability to communicate awareness of ongoing classroom events;
2. Overlapping, or the ability to manage two or more simultaneous classroom events;
3. Movement management - the ability to control and regulate pace and variety, and
4. Group focus - the ability to include the maximum possible number of pupils in each classroom activity.

It is of interest that the main overt teaching behaviours reported in this study which turned out to be significantly related to student outcomes cover these same areas of management control, thus reinforcing the value of the ecological model. The concept of the lesson segment as the unit of analysis is reinforced by Doyle's (1977) summary of some of the Barker (1963) and Gump (1969) work "Ecologically-oriented investigations have found that differences in setting characteristics, especially group size, alter markedly the manner in which environments interact with behaviour".

The analysis of these and other of the empirical "Kounin variables" will lead to extension and construction of theory in this area, which should, in turn, be able to be related to the power of the teacher input into the behaviour setting of the classroom, as a whole, and more importantly, to the subsettings of the lesson segments.

3. Methodology

The intent of the study was to make observations within the regular classroom setting. Thus teachers were not required to teach special subject matter nor to engage in specific teaching behaviours. They simply proceeded as if the recording devices were not present. In a very few cases, due to problems with natural lighting, it was necessary to shift classes from the room normally occupied. No changes were made to the ordinary timetables.

The plan was to record each teacher and class on four occasions at monthly intervals from July to October, 1979. Of the planned 96 lessons, 91 were actually recorded.

4. Data Source

(a) Subjects

The 24 teachers involved in the study (16 men, and 8 women) had volunteered to participate after having the SCMP project's aims and objectives explained to them at meetings of junior science teachers in their schools. They came from six metropolitan Brisbane schools.

The pupils in the study were three Grade 8 classes, twelve Grade 9 classes, and nine Grade 10 classes, the median class size being 27, range 20-36.

(b) Recording Procedure

Two video cameras were used, and two tapes resulted from each classroom recording session. One of these video tapes was made by a camera with a zoom lens, in a fixed position at the back of the classroom. This camera concentrated exclusively on the teacher who wore a radiomicrophone. The other videotape was of the class, and was made by a camera with a wide angle lens situated in a fixed position at a front corner of the classroom. Two omni dimensional fixed microphones on floor stands gave audio input from the body of the class. The soundtrack combined both audio sources.

(c) Additional information about such matters as class number, school climate, characteristics of classrooms, and certain teacher characteristics was obtained by the researcher who visited the schools for the videorecording.

(d) Analysis of Video Tapes

Six pupils were observed from the class videotape by trained observers in each lesson. No effort was made to ensure the same six pupils were observed on each occasion. Pupils were selected and identified, from a still photograph of the class, which made it possible to recode for interobserver agreement calculations. Criteria of selection for observation were to give approximately equal representation to all parts of the room, and not to choose pupils who were contiguous with one another.

Each trained observer had a box with eight buttons which were normally closed press-button microswitches. The button array used was:

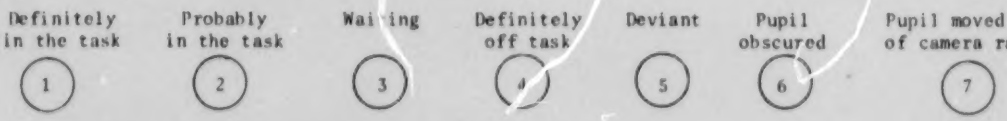


Figure 1

The 'deviant' button may be depressed at the same time as another button, such as 'waiting'.

Each of the six boxes was connected to a micro-processor which stored, compressed, and then dumped onto an audiotape the states of the switches and the times at which they changed. Thus a contemporaneous stream of behaviour was available for the six pupils throughout the lesson; after the audiotape has been played into the PDP-11 minicomputer, within 3 minutes of coding the pupil behaviour, a computer print-out of the means for the six students was available.

The segments of lessons were marked manually on a time sheet when the teacher tapes were studied, and notes made on the details of teacher and pupil behaviour within those segments. From this information segment data was obtained. The segment type, duration and frequency were available from this record.

A taxonomy of gross (or, as they have been called, macro-overt) teacher behaviours was set up from empirical observation, and relationships between the use by teachers of the behaviour categories identified and pupil on task behaviour within segments of lessons were analyzed. The results of a first analysis of these results is reported in this paper.

5. Results and Conclusions

1. The available literature on classroom management does not appear to report on task involvement and deviancy measures in secondary schools. Thus no basis of comparison was available beside that from primary, and mainly elementary, classes. Capie et al. (1979) report that 50% of the pupil time in those primary classes studied by them was spent on task. Our overall observation was that in the twenty-four junior science classes we observed, 82% of the pupil time was spent on task. Berliner (personal communication) commented that this level was comparable with what had recently been observed in U.S. secondary classes.

It would be comforting to conclude that as pupils become more mature they pay more serious attention to classroom tasks, however one of the attractions of working with children in the early grades is acknowledged to be that they are very open in their behaviour, and their powers of dissimulation are weak. Our own observations in certain specific instances in this study have thrown up cases of apparent on-taskness which fooled observers for most of a lesson, the phenomenon being dubbed "T.V. eyes". Teachers

who participated in SCMP workshop sessions at the 1980 CONSTAQ Conference confirmed the presence of some students who pretend to be on task but who often are not. If indeed such pupils make up the bulk of the 30% discrepancy between primary and secondary classes, then how teachers identify and deal with these individuals may well be a most important factor in their effectiveness. It is a point worthy of further research attention.

2. The following table sets out the level of pupil task involvement and deviancy observed in the 24 junior science classrooms studied. The unit of observation here is the whole lesson -

Table 1

Percentages of pupil task involvement and deviancy, averaged across four lessons.

CLASSROOM	DEFINITELY IN	PROBABLY IN	WAITING	DEFINITELY OUT	DEVIANT
1.	51.6	35.8	1.5	11.0	0.4
2.	44.5	22.8	2.3	30.5	0.3
3.	62.7	25.6	1.8	9.9	0.1
4.	55.0	23.1	11.0	11.0	0.6
5.	49.4	27.7	4.3	18.7	0.5
6.	37.3	32.4	6.4	23.9	0.6
7.	59.3	19.9	2.8	18.0	0.7
8.	63.5	16.7	0.5	19.3	0.0
9.	59.9	24.8	2.9	12.4	1.1
10.	61.0	26.1	2.6	10.2	0.1
11.	69.2	19.8	3.7	7.3	0.0
12.	74.1	14.4	7.8	3.7	0.1
13.*	74.3	11.9	4.7	9.2	0.0
14.	51.8	20.2	12.4	15.3	2.4
15.	60.1	24.6	2.7	12.6	0.2
16.	58.6	22.3	6.5	12.7	0.3
17.	51.8	29.3	6.3	12.6	0.0
18.*	52.1	27.2	1.7	18.9	0.1
19.	88.7	9.1	1.9	0.4	0.0
20.	79.1	18.6	0.3	2.0	0.0
21.*	52.7	14.8	1.1	31.4	0.9
22.	49.1	29.5	4.2	17.3	0.0
23.+	62.4	24.9	1.6	11.4	0.0
24.	59.1	25.0	7.1	8.9	0.4
MEAN	59.4	22.9	4.2	13.5	0.4

* Three Lessons Observed + Two Lessons Observed

Correlations between the deviancy category and two of the task involvement categories were computed. For the twenty-four classrooms 'deviancy' and 'definitely out' were positively but not significantly related (r = 0.3). A positive, significant (r = 0.52) correlation was obtained for 'deviancy' and 'waiting' but with the trimming of an extreme single point shown in the scattergram, the correlation between the deviancy and waiting scores fell to a non-significant r = 0.13.

Analysis of the 91 lessons into segments revealed 9 distinct types of subsetting as follows.

Table 2

Segments of Lessons

TYPE	FUNCTION	PUPIL TASK STRUCTURE
Organization (ORG)	To prepare students for implementation of a learning activity that forms the next segment.	Perform requested activity.
Structuring (STR)	An induction period during which the teacher provides a mental set for students.	Listen.
Dictation (DN)	To present students with information via notes on the board (written in silence) or by verbal dictation.	Write notes, listen.
Exposition (no props) (E)	To present new material which contributes to the cognitive or skill aim of the lesson, by means of "Teacher Talk".	Listen, watch, answer questions, write notes.
Exposition (with props) (E/P)	To present new material which contributes to the cognitive or skill aim of the lesson by means of "Teacher Talk".	Listen, watch teacher, answer questions, write, watch prop.
Demonstration (D)	To present or illustrate new material by means of a teacher presented activity which develops in format over a period of time.	Listen, watch teacher, answer questions, watch demonstration, write.
Small Group Activity (SGA)	To present or illustrate new material which contributes to the cognitive or skill aim of the lesson.	Manipulate appartus, take notes, collate data, discussion in group.
Individual Activity (IA)	To present, illustrate or give practice at new material which contributes to the cognitive or skill aim of the lesson.	Read, solve problems, summarize material
Assessment (AS)	To assess student understanding of previously learnt material.	Write answers, listen to teacher, check answers.

Not only do the underlying theoretical constructs necessitate consideration of subsettings of the behaviour setting of the whole class lesson, but also previous researchers (Gump, 1964; McGaw et al., 1972; Shavelson and Dempsey-Attwood,1976) have convincingly argued that whereas the whole lesson may be adequate for the consideration of pupil behaviours, it is not an adequate unit from which to calculate the means on teacher behaviour categories.

The average time each class spent in each of the above subsettings is set out below. Not unexpectedly, teacher exposition, with or without props, accounted for about half the total amount of observed time. Dictation of notes and assessment of pupils were the least frequently observed subsettings.

Table 3

Percentage of Lesson Time Spent in Each Type of Lesson Segment Averaged Across Four Lessons

CLASSROOM	ORG	STR	DN	E	E/P	D	SGA	IA	AS
1.	10	1	9	8	44	13	-	15	-
2.	2	2	-	3	39	-	46	8	-
3.	1	4	-	18	15	-	46	16	-
4.	19	12	-	18	24	-	-	27	-
5.	12	2	-	13	30	-	22	11	10
6.	17	13	-	33	29	-	-	-	8

7.	11	2	1	12	47	24	-	3	-
8.	7	2	-	29	14	18	11	19	-
9.	39	-	-	15	11	-	28	7	-
10.	16	1	1	45	3	1	-	32	-
11.	13	9	-	12	57	2	-	7	-
12.	15	6	2	26	24	18	-	7	-
13.	24	-	-	16	25	6	-	21	8
14.	12	-	7	26	18	-	-	-	37
15.	10	1	1	4	39	3	23	19	-
16.	12	1	-	1	31	31	23	1	-
17.	14	3	-	44	2	12	19	6	-
18.*	8	-	-	-	69	6	-	17	-
19.	5	2	-	-	78	2	-	13	-
20.	11	2	-	15	8	11	53	-	-
21.*	2	3	-	4	22	6	21	42	-
22.	10	2	-	52	15	-	7	14	-
23.+	1	1	-	51	17	-	-	30	-
24.	12	2	-	39	14	15	-	7	11

* Three Lessons Observed + Two Lessons Observed

A careful inspection and comparison of the table of class task involvement levels in different types of subsetting yields results of theoretical significance. For example, classrooms 19 and 20 both show pupils with an extremely high level of task involvement, where the 'in'categories summed come to 98%, but where the number and kinds of subsettings are quite different from one another. Classroom 19 was heavily teacher-dominated, 78% of the observed time being devoted to teacher exposition with O.H.P. to the whole class, whereas classroom 20 spent 53% of the observed time in small group activities, where the pupils focused on an experimental task. Classrooms 2 and 3 also had about half of their total time occupied by small group activity, yet three times as many pupils were out of the task in one as in the other (see Fig. 2).

Clearly, as the teacher is part of the subsetting so his input is able to alter the whole subsetting in significant ways. Obviously, some teachers possess routines which they are able to apply effectively in some situations for which other teachers may lack the appropriate techniques. This reasoning which led us to a preliminary investigation of teacher behaviour categories.

Teacher Macro Overt Behaviours

An ongoing log was kept on a time base of teacher behaviours on a large scale (or macro) level as the 91 teacher video tapes were analysed. Seventeen invididual types of macro overt-behaviours were recognized and collapsed into the following categories.

Table 4

WITH WHOLE CLASS	WITH SMALL GROUP	TEACHER CENTRED
Organizing	Organizing	
Explanation	Explanation	Walking
Exposition	Exposition	Not Interacting
Holding Self in Readiness/ Surveying Whole Class	Holding Self in Readiness/ Small Group	Getting Equipment
Order (Safety/Control	Order (Safety/Control)	
Social	Social	

In this phase of the study, detailed attention was then paid to the above. Fifteen behaviour categories with respect to the subsetting of small group activity. The other subsettings will be studied similarly later.

Of the 91 available class tapes, only 19 featured small group activity, with 11 teachers of the 24 in the study being involved. The time involvement of these 11 teachers in the 19 small group activity segments was coded for each of the above 15 macro-overt behaviour categories. As a principal components analysis was hardly appropriate for such a sample, a Pearson correlation matrix for the task involvement of the pupils against the macro overt behaviour categories of the teachers was computed.

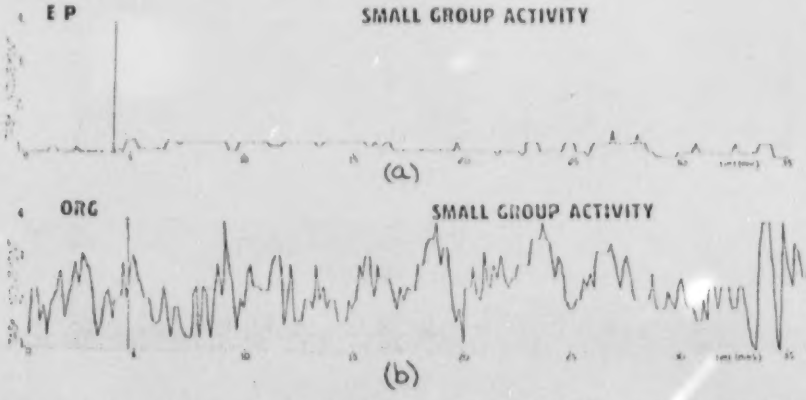
Four significant results ($p<0.05$) obtained from this analysis. Pupil behaviours quoted are 'in' and 'out', that is, 'definitely in' and 'probably in' have been collapsed, on the basis that in small group activity the ambiguity ratio is fairly high.

Table 5

Pupils	Teacher: Whole Group Explanation	Teacher Surveying Whole Group
IN	0.4462 (S= 0.028)	0.4310 (S = 0.033)
OUT	Teacher: Small Group Explanation 0.5560 (S= 0.007)	
WAIT		Teacher Gets Out Equipment 0.5436 (S = 0.008)

Thus, a teacher who has been asked a question by a member of a small group, and who then repeats the question and responds to it for the benefit of the whole class, finds that the class responds by a high degree of attention. When a teacher responds to a request for help by a member of a small group by supplying an explanation solely to that group, the class responds by showing a high degree of off-taskness. Although the figures shown here do not demonstrate it, this fits with observed behaviours of certain teachers who can hold the whole-class surveillance mode while responding to individuals or small groups, and who also have a class which shows a high degree of ontaskness.

A striking example of the difference in class responses elicited by the two surveillance modes mentioned above is shown in the following time series displays of pupil task involvement in small group activity segments given by two different teachers. A value of 1 is maximum pupil task involvement, and a value of 4 implies that pupils are not involved in the task.



In (a) the teacher is using the whole group surveillance mode, and the pupils are very strongly task involved, whereas in (b) the teacher is responding to single groups and is not using whole group surveillance and the pupils here display lack of task involvement.

Another teacher behaviour likely to occur in science classes is getting out equipment, and in these

correlations a significant positive relationship was shown between this activity and students' waiting. It follows that if no task was set to occupy the time the teacher took to do this, then students must wait, which in a sense then became the task.

It seems clear that congruence between the qualities of the subsetting and the teacher techniques applied is a critical factor, such that this one aspect of the subsetting (teacher behaviour input) may significantly alter the effectiveness and nature of the subsetting.

3. Reliability coefficients which measure the degree to which pupil classroom behaviour was consistent across a series of four occasions, indicated a high reliability (or stability) of behaviour, exceeding 0.8 in one case. Teacher behaviour gave a much lower stability, which is indeed what one would expect theoretically. Whereas pupil behaviour categories are very general and few in number, teacher behaviour categories are highly differentiated and specific, and there are a large number of them (Wallen, 1970).

The ecological psychological construct of the behaviour setting spells out very specific teacher behaviours appropriate to different settings. Thus different settings coerce different behavioural routines or bundles of techniques from teachers but still contain for the pupil the notion of a task to be done, in which they are involved, or not involved.

4. It follows from the above, from accumulating data from ecological psychologically based studies and other sources (Brophy, 1979) that since subsetting or context has an important influence on both teacher and pupils and affects their behaviour patterns accordingly, that the notion of generic teaching skills which suffice for all teaching situations is not appropriate. Indeed, from this study, there is neither empirical nor theoretical evidence for entertaining the concept.

5. Educational Relevance of Study

In the past, much theorizing has been done about effective learning and teaching in the classroom in the absence of any real knowledge of the classroom setting itself as an entity.

However, work in the ecological vein of Barker and Kounin, with its accurate observation and measurement of the classroom setting and subsetting variables and teacher behaviours, has the advantage of making sense to teachers. It follows therefore, that studies conceived, carried out, and reported in such a framework are likely to have a greater impact upon the work face than many other types of studies.

The present study represents a significant step towards understanding what the makeup of the classroom is at junior secondary level. At present no information exists in the literature about the variables we are measuring at the level at which we are measuring them. Lahaderne (1968) observed that teachers who are alert to pupil cues and skilled in their interaction with the subsetting, thus reinforcing pupil task-centred behaviour develop attitudes of academic satisfaction in their pupils, even though many of these same pupils expressed dislike of school. The relevance of this to certain of today's reluctant, rebellious teenagers is clear.

Teachers gauge the "success" of their teaching not so much in terms of students' grades, as by the immediate pupil response they get while teaching. This point was well demonstrated in this study by the interest the participant teachers showed in the time series displays of their pupils' task involvement.

Society appears at present to be greatly concerned with the education of their adolescents, who in turn need skills for coping with the effects of accelerating change on society and work.

Teachers more than ever before need to be able to manage and organize experiences which will dispose their pupils to gain such skills.

To summarize, the Science Classroom Management Project, of which this paper has reported a segment,

has both theoretical and practical relevance which give promise of useful applications of its findings in many areas of the educational enterprise.

REFERENCES

Barker, R.G. On the Nature of the Environment. Journal of Social Issues, Vol.19, No. 4, pp 17-38, 1963

Barker, R.G. Ecological Psychology. Stanford University Press, Stanford, 1968.

Berliner, D.C. "Tempus Educare", In Research on Teaching: Concepts, Findings, and Implications. P.L. Peterson & H.J. Walberg (eds.) Berkeley, McCutchan, 1979.

Capie, W.R., Dillashaw, F.G. and Okey, J.R. Keeping Students "On Task". Science Teacher, 46, pp.31-32,1979

Doyle, W. The Uses of nonverbal Behaviours: Toward an Ecological Model of Classrooms. Merril-Palmer Quarterley, 23, 3. pp.179-192, 1977.

Gump, P. Environmental Guidance of the Classroom Behavioural System in "Contemporary Research on Teacher Effectiveness, Biddle, B.J., and Ellena, W., Eds, Holt Rinehart and Winston, N.Y.1964.

Kounin, J.S. Discipline and Group Management in Classrooms. Holt, Rinehard, and Winston, N.Y., 1970

Kounin, J.S. and Skerman, L.W. School Environments as Behaviour Settings. Theory into Practice, 18, pp. 145-151, 1979.

Lahaderne, H.M. Attitudinal and Intellectual Correlates of Attention.: A Study of Four Sixth Grade Classrooms, Journal of Educational Psychology. Vol. 59, No. 5, pp.320, 324, 1968

McGaw, B, Wardrop, J.L. and Bunda, M.A. Classroom Observation Schemes: Where are the Errors? American Educational Research Journal, 9, 13-27, 1972

Medley, D.M. The Effectiveness of Teachers In Research on Teaching: Concepts, Findings and Implications. P.L. Paterson and H.J. Walberg (eds.). Berkeley, McCutchan, 1979.

Shavelson, R. and Dempsey-Atwood, N. Generalizability of Measures of Teaching Behaviour. Review of Educational Research, 46, pp.553-611, 1976

THE REQUIREMENTS OF A SUCCESSFUL ACTION PROGRAM

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The origins of action research

The concept of "action research" has its origins in the work of Kurt Lewin (1946), who developed and applied it over a number of years in a series of community experiments in integrated housing, equalisation of opportunity for employment, the cause and cure of prejudice in children, the socialisation of street gangs, and the better training of community leaders (Marrow, 1969). The work was unprecedented in two respects. Professional researchers had previously not worked so closely with community groups in the resolution of practical problems; nor had those affected assumed such responsibility for the improvement of their circumstances.

Lewin describes action research as a means of "rational social management" which proceeds in a spiral of steps, each of which is composed of planning, action, and fact-finding about the result of the action. In the Lewinian model the sequence begins with a general idea which prompts an initial reconnaissance to formulate the general plan, and to devise the first action step. Once the step is taken information about the effect of the action is collected. The general plan is then reviewed and the second action step is planned, initiated, evaluated, and so on through a series of cycles. The distinctive feature of the model is its close linking of the gaining of knowledge about practice, and its systematic review of preferred courses of action in the light of an increasingly informed general principle. Fact and explanation are sought in a context shaped by the aspirations and intentions of participants in practical action.

The grounding of the research in practical application coupled to growing understanding and systematic reference to normative considerations, suggests its potential for the systematic evolution of knowledge about the curriculum in practice. The method has been given significant attention in the educational research literature in two waves; the first around 1950, particularly in relation to the work of Stephen Corey at Columbia Teachers' College (Corey, 1949 a & b, 1953), and more recently in the work of John Elliott and Clem Adelman in the Ford Teaching Project (Elliott and Adelman, 1973a, 1973b, and Elliott, 1976-7, 1978). Corey's work coincided with American interest in school-based curriculum development and the idea of "teachers as researchers" existed in a supportive context. However, in the search for legitimacy, the methods used sought to emulate the developing positivist traditions of American educational psychology. The demand to test hypotheses in a more formal way had the effect of dislocating the spiral of action and evaluation steps proposed by Lewin. The resultant discontinuity between the activities of understanding and application, the linking of which had been a strength of the Lewinian model, left teachers with methods of inquiry which were not subtle enough for the complexities of the social life of schools, and action research (as it had been interpreted) faltered.

The reappearance of the language of action research two decades later in the Ford T project coincides with perspectives on curriculum inquiry which began to reassert the breadth and complexity of the field and the importance of practitioners as inquirers in it (for example the views of Stenhouse, 1975 and Schwab, 1970). Schwab's influence is apparent in the work of Elliott (e.g., 1978), and it is significant that his research with Adelman bears a closer resemblance to the Lewinian model than it does to the later American developments.

The possibility of an educational science

The fluctuating fortunes of the action research concept and method seem to stem from the lack of a theoretical rationale which can simultaneously comprehend the conditions for changing educational practice, the social psychology of participation in research, and the development of educational critique. Neither of the two sciences recognised by Habermas (1972, 1974), the empirical-analytic or the hermeneutic (interpretive), provides a sufficient basis to develop a theory of society on which any theory of education must rest. The former addresses an object world of the type of moving objects; of things, events, and conditions which are in principle capable of being manipulated. The objectifications of reality possible are conditioned by a prior interest of *technical control*. Because empirical-analytic knowledge can only assume the form of causal explanations or conditional predictions it cannot justify educational practice which must take account of the *intentions* of participants in the process and their ultimate right to autonomy.

On the other hand the hermeneutic sciences address an object world of the type of speaking and acting subjects; of persons, utterances, and conditions which in principle are structured and to be understood symbolically. The hermeneutic sciences are limited to objectifications of reality guided by a prior *practical* interest, an interest which requires a partial acceptance of norms of a group to permit the intersubjective communication necessary to interpret traditional complexes of meaning. Thus hermeneutic knowledge is normative in character and restricted to explication of cultural assumptions, values and world views from within the frame of reference of participants, and is necessarily relativist in nature. That is, both empirical-analytic and hermeneutic knowledge are restricted in their application to the practice of education because of a priori conditions which pre-empt the uses to which they can be put. We may know how to effect a goal, and whether the goal is valued by a group, but neither of these can justify the provision of education in a context where autonomy is ultimately valued. Habermas goes on to argue that *critical theory* is capable of responding to a higher *emancipatory* interest which transcends the *technical* and *practical* interests of the empirical-analytic and hermeneutic sciences. He cites the critiques developed by Marx as a theory of society and by Freud as metapsychology as incorporating an interest which uses the process of critical self-reflection as a means of liberation through knowledge. The development of reflection is seen as the process by which, in Freudian theory, the link between theory and therapy is maintained as is the link between theory and praxis in Marxist theory.

The role of participants and the structure of the process of critique are described by Habermas:

> 'The mediation of theory and practice can only be clarified if to begin with we distinguish three functions, which are measured in terms of different criteria: the formation and extension of critical theorems, which can stand up to scientific discourse; the organisation of processes of enlightenment, in which such theorems are applied and can be tested in a unique manner by the initiation of processes of reflection carried out within certain groups toward which these processes have been directed; and the selection of appropriate strategies, the solution of tactical questions, and the conduct of the political struggle. On the first level, the aim is true statements, on the second, authentic insights, and on the third prudent decisions.'
>
> (Habermas, 1974, p.32)

The application of critical theory is contingent upon the development of discourse to perform the appropriate tests at each level, and the use of self-reflection as a means of learning from experience. Initiation of the process in an education context requires the development of a critical community of inquiry among teaching practitioners and the creation or adaptation of techniques which make complex experience and submerged or institutionalised assumptions and beliefs more accessible to critique.

Three levels of self-reflection

As indicated above, Habermas suggests three levels on which self-reflective activity must occur and specifies different criteria which are to be met at each level. Kemmis (1978) has developed from these a set of principles outlining the nature of self-reflection required at each level. The original principles were outlined to guide the development of self-reflection in the Curriculum Development Centre but require only minor modification to be applicable in the school context. The following analysis draws heavily on the content and language of those principles.

The principles aim to improve the work of the school (or organisation) through an articulation of the theory which guides and justifies its work; the development of wise and prudent practice which accurately reflects the implications of the theory, and which is examined as a means of informing the theory; and finally the authentication of organisation, making it responsive to the demands of both theory and practice and affording the opportunity for critique to occur.

The values which underpin the model are those of self-awareness, self-control, autonomy, and a commitment to informed responsibility for professional action. These oblige the practitioner to act in a spirit of experimentation by thinking critically about the problems of education as a practice; to devise methods of investigation, to propose solutions, while understanding their ramifications within and across levels; and to try them out.

At the three levels of theory, organisation and practice, the principles guiding self-reflection proposed are as follows[3]:

Theory

The aim at this level is the improvement of the educational theory which guides and justifies the work of the school[4]. Improvement is defined in terms of increasing comprehensiveness and consistency, internal and external. Internal consistency is enhanced as the coherence between individual propositions of the theory increases and their contradictions are exposed and removed by the process of critical analysis. External consistency is enhanced as the propositions embody more realisable aspirations, describe the work more accurately, and prescribe organisation and action more comprehensively. The constant referral of theory to practice ensures that the language of theory incorporates the understandings of participants and is *comprehensible* to them.

Ideally the first step in theoretical reflection is simply to attempt to formulate theory or rationale, and to flush theoretical commitments and assumptions into the open. Theory is then accessible to critique. One of the difficulties in many school situations is the virtual absence of theory, often described as "implicit" theory or as "allowing the work to speak for itself". Either case removes the possibility of critique. In work with schools early strategies must take account of this and encourage the articulation of theory, usually beginning with practice or modes of organisation. Other problem sources recognised at this level are the intransigence of existing theories (or refusal to elaborate "implicit" theory), blind commitment to theoretical or value positions, proliferation of theoretical statements (or commonsense understandings) without systematisation or integration.

The methods advocated for theoretical reflection are the methods for "scientific discourse"[5] characterised by the process of "conjecture and refutation" (for example in proposing an hypothesis and attempting to disconfirm it, or in proposing an interpretation of a situation and testing it by teasing out its implications for the situation and checking whether or not they hold). In this sense, the articulation of theory proceeds as it is tested against, and informed by, interaction with organisation and practice.

Successful self-reflection at the theoretical level means an increased sense of the intellectual control of the work and a capacity to justify the work in terms of the comprehensive theory which underpins it.

Organisation

Organisation refers to two aspects: the *organisation of self-reflection* as a means of understanding, improving and justifying practice; and the *organisation of the work itself*. The latter is the subject of reflective activity in the same sense that theory and practice are.

Organisation of self-reflection

The organisation of self-reflection (at each level) requires the opportunity to engage in the critical debate under conditions where "symmetrical communications"[5] prevail. This is clearly a long term goal which requires not only suspension of existing formal and informal hierarchical relationships, but significant changes in conversational strategies, often subconscious, and invariably firmly embedded in the social interaction repertoires of participants (see Towards Symmetrical Communications, Deakin

University, 1980). The approach toward the ideal of symmetrical communications can be initiated by ensuring that participants are committed to the resolution of particular problems, recognised as authentic by the school community, and made concrete by appropriate methods of investigation and systematic reporting.

Methods of investigation

The chief function of investigation in the initiation of self-reflection is to make aspects of experience more visible. This is not always easy to achieve. Assumptions, organisation, and habits all have one useful aspect in common. They remove the need to work from first principles. To this end their invisibility contributes to their function. But that virtue becomes a vice when reflection is called for. The investigation must provide the means to unfold layers of meaning as forgotten (or institutionalised) assumptions and habits of mind and practice are raised to the surface. Indeed, it may be difficult in self-reflection to maintain control over a debilitating and unbridled scepticism about theoretical assumptions, organisation and practice. What is needed is a method for the organisation of self-reflection, as Lewin recognised in suggesting the method of action research. Nevertheless, as the Lewinian model implies, the problem never quite stands still. Therefore in the school context, it is usually necessary to employ methods of investigation (and technology) which are flexible and fully understood by participants. This also forges an essential link between the authenticity of the problem and the generation of understanding which is seen to be authentic as a means to its resolution. It follows from this perspective that interpretive methods (e.g., "historical" accounts, case studies), which take account of the intentions and aspirations of participants are of value because of their implicit linking of knowledge about the problem and subsequent motivation for action.

Collaboration is an important ingredient in the organisation of self-reflection at all stages, problem definition, investigation, action, and reporting. Collaboration links the network of individuals across working groups established to address problems agreed to be authentic, strengthens commitment, and encourages the development of languages which allow participants to objectify their personal experiences. When groups from the larger school community are utilised to investigate problems frequent reporting is necessary to provide access to information for other members of the community, feedback about unforeseen ramifications of actions, and, most important of all, the opportunity for critique.

Reporting also serves to "concretise" the investigation; to ground it in language appropriate to the larger community and to crystallise its expression in its most defensible form as the subject for critique.

Organisation of the work

The aim of self-reflection at the level of organisation is the improvement of organisation with respect to its *authenticity* and appropriateness. Organisation becomes more authentic as it becomes more responsive to the values, aspirations and purposes of the participants in the work, and to the extent that it embodies their commitments as actors in a community of common interests. It becomes more appropriate as it becomes more fully adapted to the practical circumstances under which the work is carried out. This implies a capacity to distinguish between genuine practical constraints and

intractable, poorly adapted means of organisation.

Because organisation has been devised in the past as a way of *solving* the general problem of working from first principles (for example, the division of knowledge into subjects, the grouping of students, the sequencing of learning activities in a syllabus statement or lesson plan), there is a strong tendency to treat the organisation of the work as intransigent and fixed. It is fixed by a sense that organisation is determined by pressures or constraints which lie beyond participants' control: of the immutability of traditional ways of working. Reflection at the level of organisation must therefore be preceded by a process which makes it visible, describes it, and makes it accessible to reflective activity.

The aim is to treat organisation problematically and to act in a spirit of experimentation. To achieve this, it is necessary to identify and articulate problems at the level of organisation. Such problems have two sources: theory and practice. Problems of organisation arising from theory include mismatches between derived aims and organisational potential, mismatches between values embedded in the rationale and the values implicit in the operation of the school, and problems of unrealistically high aspirations or unattainable goals. (Many of these problems concern the compatibility of ends and means.) Problems of organisation arising from practice include problems like those of impracticability, inefficiency, contradictory operations, working at cross-purposes, lack of time or resources to act in accordance with proper procedures, and the invention of new procedures when existing means will work.

The resolution of a problem identified at the level of organisation may occur by amending organisation itself, by redefinition of goals at the level of theory, by adapting different tactics at the level of practice; or more usually by a combination of these because the levels are highly interactive.

The process of self-reflection at the organisational level is thus analogous to the parliamentary process of "legislation and amendment". The analogy carries with it the implication of participation by those affected.

Success in self-reflection at the level of organisation should be evident in smooth operation of the school and satisfaction with the conduct and outcomes of the work of the school.

Practice

The aim of self-reflection at this level is the improvement of practice as it becomes wiser and more prudent, as it becomes better adapted to contemporary working conditions (in terms of both constraints and opportunities), and as it becomes more sensitive to the complex interdependence of action, circumstance, and consequence in the social and educational interactions among practitioners and students in the work situation. Practice is also improved as it more nearly reflects the *free commitment* of participants (practitioners initially but ultimately of students as well) to the work. (The criterion of free commitment is the underlying value at the level of practice which parallels the criterion of authenticity and the level of organisation, and those of comprehensibility and understanding at the level of theory).

The precursor of self-reflection at the level of practice is again to make the work more visible, to describe it in a form which makes it accessible to critique. The problems identifiable at this level stem from the practical activities in the school; techniques that fail to work, disagreement among participants about the worth or efficiency of particular activities, problems of overwork, of insufficient time, of not knowing what is going on, and so on. The self-reflective process must seek to devise alternative ways of working when problems stem directly from practice, or to change organisation or theory when these are considered to be the cause of the perturbation in the system.

Reflection on practice has a purpose beyond the modification of extant forms of organisation and theory, however: *it is to comprehend the conditions of practice which might suggest new principles and organisational structures.* Just as theory has its internal criteria for development, so does practice: the coherence of work or action (this is not simply a value but a demand shaped by the needs of recipients). Identifying structures within action may provide new insights to feed theory and organisation and it is this possibility which suggests *a starting point for the initiation of reflective activity.*

The method of reflection at the level of practice is at its simplest, the method of "trial and error". The point of reflection at other levels is to create principles and organisational forms capable of generating alternative desired courses of action and reducing the number of "errors" of practice (failure, incompetence, divisiveness, lack of free commitment, alienation and so on).

Success in self-reflection at this level should be evident in the personal satisfactions of participants and the attainment of their individual and group purposes.

Application of the principles

While the principles outlined above are prescriptive in the ultimate sense it is obvious that schools will be unable to conduct detailed self-reflection across levels and across the diversity of relevant contents, except perhaps over a long period of time. To initiate an action program, it is reasonable to centre on a *particular content* known to be of concern (for example, assessment and reporting) and begin at the level of practice (or organisation[6]) and allow the implications of existing and planned activities to flow through the levels of both theory and organisation (or practice). It is unsound strategically and in principle to begin with attempts at articulation of the theory which "drives" the practice; it is doubtful whether school communities have an educational theory comprehensive enough to discriminate between practices and organisation which may or may not be manifestations of it. It is more realistic and constructive to concentrate on the coherence between *favoured* practices or organisation as a way of building theory. Practitioners feel more comfortable with such a strategy; it recognises their "clinical expertise" (McLaughlin and Marsh, 1978) in the organisation and practice of teaching; has immediate utility in terms of identifying program strengths and weaknesses; and obviates the risks of the romanticism possible when links between theory and practice are ignored. It may be desirable to proceed with this emphasis on the level of practice until confidence builds but the ultimate goal is the development of reflection which freely ranges over the

three levels.

Strategy for an action program

The strategy developed by the Deakin University Action Research Group for the initiation of an action research program based on the critical social science framework outlined above envisages five stages: identification of a general problem area, negotiation with schools for participants interested in working on the problem, workshops to stimulate the work, and a subsequent cycle of meetings to fortify the work and growing independence of the critical community.

Getting started

The identification of a problem area is usually relatively easy through informal contacts of members of the group with staff in the schools. It has been necessary to identify the *general* content for the particular program in order to provide a context which makes it clear to all participants that they are gathered to share experience and intellectual resources to devise action to solve authentic problems of mutual concern. However, it is of paramount importance that the particular problems are identified by participants as their own. Once potential participants are identified, details of the proposed program are prepared and formal agreement between the group, the schools affected, and the participants is sought. The proposal is based on the recognition of the worth of existing practice as the work of competent and reasonable persons and, at the same time, as the source of problems which precipitate change; change which can be managed appropriately and rationally only by the practitioners themselves. The initial agreement must ensure that the work of participants is subjected to the normal protocols and procedures extant in the school. Because the establishing of critical communities is in its infancy, it is desirable that participants are *involved* (experience suggests that there will be considerable enthusiasm if problem areas are judiciously chosen). It is pointless beginning the process with "principal's nominees" or continuing if participants no longer find the work relevant. The right to withdraw must be recognised. In the Deakin University action research projects we have found it convenient to work with groups of about 20 with three or four representatives from a number of different schools.

The workshops

Workshops begin with the reaffirmation of participants "ownership" of problems and the shared commitment of the group to support the work. To embark on the cyclic process of problem identification, action and reflection, the group must develop a "project perspective" and a common language for the description. This is achieved by asking participants to describe what is currently done and to identify the problem. The pooling of experience provides the basis for agreement about appropriate terminology, develops a shared perspective and promotes the realisation that others share similar problems. This is the first stage in problem *objectification*: the development of terminology and the dissociation of the "self" from the problem. This stage of the process is often stimulated by a "guest speaker" who can illuminate the particular content area of interest; the thrust of this address must be the building of confidence in the possibility of successful action, often through recounting the achievements of other schools.

Participants are then introduced to the nature of action research. The initial session will have developed the general plan. The aim now is to begin to formalise both a general plan and the first action step, and to devise an appropriate method of monitoring and evaluation. The data collection techniques suggested involve low technology and are described only in principle to ensure that authentic problems are not redefined to fit existing techniques. The notion of the "subjective spectator" captures the spirit of the aim. The specific techniques suggested may range from interviews, diary or log keeping, through to teacher-managed proxemic analysis. The overriding intention is to add "ownership" of the method of investigation and resolution to the ownership of the problem.

The next phase within the workshop consists of two parts, the identification of problems and strategies in detail by "within school groups", and reporting back to the group at large. The work within school groups is aimed at ensuring problem authenticity and realistic strategies; while at the same time enhancing group cohesion and a commitment to action. The identification of problems must be couched in terms of strategies for improvement to avoid the stultifying effects of thinking for too long about how bad life in the school might be. The dangers of within school groups are that vision may be a little limited and proposed strategies context-bound (rather than context-sensitive). Reporting back to the larger group allows the broadening of vision through the consideration of alternative strategies devised by other groups, and provides the opportunity for critique.

The role for the facilitators is crucial at this stage in establishing and maintaining social conditions which can support the emerging self-critical process. There must be a commitment to constructive criticism in an atmosphere which is essentially supportive, empathetic, practical and helpful. The development which must parallel constructive criticism is that of constructive responsiveness in terms of continued improvement of the strategies for action.

It is sometimes productive for this phase to be repeated; within school groups can benefit from the exposure to new ideas and critique by a period of reflection and reformulation. Reporting back this time serves to crystallise the commitment to action as well as providing the opportunity for further fine-tuning by means of the larger group's critique.

A note on technology

In order to build commonality of understanding, it is important to summarise progress often and to keep it visible. Agreements, decisions and "issues arising" must be recorded together with the evolution of each group's general plan first action step and evaluation. A useful strategy is to record on overhead transparencies which afford accessibility, a commitment to group (rather than individual) ownership of the work and the subsequent opportunity for photocopying the "file" of the workshop for all participants. The informality (as opposed to typed minutes) is a reminder that the aim of the work is action not a product.

The political character of innovation

The final phase of the workshop must be devoted to preparing the now enthusiastic participants to resistance to action and barriers to change on return to their respective schools. There is no panacea for this; negotiating the implementation of the general plan and first action step is a process which requires "local knowledge". The important point is to take the opportunity to devise a way of proceeding, and allowing the group as a whole to consider it in much the same way as the original plan was conceived.

Commitment to the immediate future

The workshop is rounded off by agreeing to a timetable for subsequent meetings and establishing commitment to reports of progress from participants. It is helpful if groups can foreshadow the type of report (and progress) they expect to make.

Subsequent meetings

The fundamental task of the subsequent meetings is maintaining the cycle of action and evaluation steps. The community of inquiry must maintain its project perspective, its group identity as a whole, and as its contributing smaller groups; and its commitment. The latter is the most difficult once the optimism of the workshop is rubbed against the realities of school life. Essentially, the aims are still the same, to remain task-oriented and to emphasise action as the focus for improvement. There must be an opportunity (and implicit commitment to the group) to report, discuss, compare, reflect, and importantly to articulate the plan of action. Facilitators must be supportive and should not allow participants to expect too much. Modest achievements are the rule.

The progress of meetings must be recorded and commitments to further reporting and "issues to be resolved" at subsequent meetings must be circulated. It is appropriate fairly early in the meeting cycle to hand over roles in the process to participants. In building independence and self-determination of the group, the facilitators must cheerfully face redundancy. Their reward for excellence is obsolescence.

Long term goals

For the particular group involved, the aim is the growth of commitment to self-reflection and the development of strategies of action and inquiry which are capable of comprehending experience and improving practice in the problem area addressed. Once the process is mastered and understood in this area, its application to the multiplicity of experiences that constitute the life of the school is envisaged. The corollary to this process is an emergent capacity to *justify* the theory which guides the practice, the organisation which makes it possible, and the practice itself.

The development of self-awareness and self-control as values is parallelled by the emergence of autonomy and responsibility. These are ultimately linked to a view of accountability which sees the school accessible to public scrutiny because of its capacity to justify its practice in terms of a theory of education which has withstood the test against criteria of both "truth" and practicability.

To this end, the development of a more formal description and reporting of the process of inquiry is required. It may then be possible to talk of an action "research", which accumulates knowledge not only in terms of an improved practice, but in terms which make the knowledge and its critique accessible to practitioners, other action researchers and the community at large.

Concluding comments

The purpose of this paper has been to describe a theoretical rationale for the implementation of an action program and to distil the early experience of its application. Critical social science offers a comprehensive strategy for inquiry which can begin with inconsistencies or perplexities arising from theory, organisation or practice, and through the process of self-reflection provides the opportunity for improvement across the three levels. The systematic accumulation of knowledge made possible allows the development of a justification of practice which both transcends and embraces utility.

The experience of the Deakin University Action Research Group in applying the rationale has been incorporated into a framework of principles for the conduct of action programs. The group is presently engaged in the further application of the rationale in new areas of interest to schools (for example, parent involvement) with both clusters of schools and individual schools.

NOTES

[1]The authors gratefully acknowledge the support and advice from Dr Stephen Kemmis in the preparation of this paper.

[2]The examples are reminiscent also of Freire's (1972) process of "conscientization".

[3]The order here is not intended to indicate that the activities are a sequence, rather the process of critique is interactive across levels.

[4]Schools already have a rudimentary form of this in the "school policy" document. The aim is to increase the rigour and comprehensiveness of policy through a stage where it might be termed a rationale and ultimately to a theory which is rigorous in application and comprehensive in intent.

[5]The use of discourse to attempt "to come to an agreement about the truth of a problematic statement or the correctness of a problematic norm carries with it a supposition that a genuine agreement is possible" (McCarthy 1976, p.xxvi). Habermas argues that provided the "rational" decision is based solely on better argument, such agreement is possible. The characteristic demanded of discussion to achieve this end is that it be "free from all constraints of domination, whether their source be conscious strategic behaviour or communication barriers secured in ideology or neurosis". "In particular, all participants must have the same chance to initiate and perpetuate discourse, to put forward, call into question, and give reasons for or against statement, explanations, interpretation and justifications. Furthermore, they must have the same chance to express attitudes, feelings, intentions and the like, and to command, to oppose, to permit, to forbid, etc." (ibid, p.xvii). This is described as an "ideal speech situation" where discourse is "freed from the constraints of action" in the interests of the pursuit of "truth". Dietrich Brandt (1978) uses the phrase "symmetrical communications" to capture the sense of the premise. (See also "Towards Symmetrical Communications", videotape, Deakin University, 1980 and Kemmis, 1980).

REFERENCES

BRANDT, D. Workshop on "symmetrical communications" conducted at the May 1979, Annual Conference of the Higher Education Research and Development of Australasia (HERDSA). The concept is explored in the HDZ Aachen: Activities and Context, a collection of papers prepared for the Fourth International Conference "Improving University Teaching", Aachen 25-29 July 1978. The paper of particular interest is: Bruno Wernet and Irene Drexler, "Structures of communication and interaction in courses for junior staff members of faculties of engineering, TH Aachen".

COREY, S.M., Action research, fundamental research and educational practices, Teachers' College Record, 1949a, 50, 509-514.

COREY, S.M., Curriculum development through action research, Educational Leadership, 1949b, 7, 147-153.

COREY, S.M., Action Research to Improve School Practices, New York: Teachers' College, Columbia, 1953.

DEAKIN UNIVERSITY, "Towards Symmetrical Communications, Videotape, 1980.

ELLIOTT, J., Developing hypotheses about classrooms from teachers' practical constructs: an account of the work of the Ford Teaching Project, Interchange, 1976-7, 7(2), 2-22.

ELLIOTT, J., What is action research in schools? Journal of Curriculum Studies, 1978, 10, 355-357.

ELLIOTT, J., and ADELMAN, C., Reflecting where the action is: the design of the Ford Teaching Project, Education for Teaching, 1973, 92, 8-20.

ELLIOTT, J., and ADELMAN, C., Supporting teachers' research in the classroom, New Era, 1973, 54, 210-215.

FRIERE, P. Pedagogy of the Oppressed, Harmondsworth: Penguin, 1972.

HABERMAS, J., Knowledge and Human Interests, trans. Jeremy J. Shapiro, London: Heinemann, 1972.

HABERMAS, J., Theory and Practice, trans. John Viertel, London: Heinemann, 1974.

KEMMIS, S. de C., On the organisation of self-reflection in the Curriculum Development Centre, Working Paper 14, August 1, 1978, Curriculum Development Centre, Canberra.

KEMMIS, S. de C., "Symmetrical Communications: Developing Mutual Understanding and Consensus in Course Teams", in J.E. Armstrong and R. Store (eds.). Evaluation and Distance Teaching, Townsville: Townsville College of Advanced Education, 1980.

LEWIN, K., Action research and minority problems, Journal of Social Issues, 1946, 2, 34-46.

MARROW, A.J., The Practical Theorist: The Life and Works of Kurt Lewin, New York, Basic Books, 1969.

McCARTHY, T., "Translator's Introduction" in Jurgen Habermas, Legitimation Crisis, Heinemann: London, 1976.

McLAUGHLIN, M.W., and MARSH, D.D. Staff development and school change, Teachers' College Record, 1978, 80, 69-74.

SCHWAB, J.J., The Practical: A Language for Curriculum, Washington, D.C.: National Education Association, 1970.

STENHOUSE, L., (ed.) An Introduction to Research and Development, London: Heinemann, 1975.

PREDICTIVE VALIDITY OF MY CLASS INVENTORY

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Escalated interest in the conceptualization, assessment, and study of student perceptions of psychosocial characteristics of their classroom learning environment has been evident in several different countries since the late 1960's. Recently much of this work has been conveniently synthesized in a number of key works including two reviews (1, 2), two books (3, 4), a monograph (5), a meta-analysis (6), and a guest-edited issue of the journal Studies in Educational Evaluation (7).

When used as criterion variables in prior curriculum evaluation research, student perceptions of classroom environment characteristics have differentiated revealingly, usefully, and appreciably between classrooms following alternative curriculum materials or instructional strategies (8, 9, 10, 11, 12, 13, 14). Also other studies have established the criterion validity of classroom environment perceptions in differentiating between classrooms varying in class size (15, 16), grade level (17, 18), and subject matter (19, 20, 21, 22), and between classrooms in five different types of schools (urban, rural, suburban, vocational, alternative) (23).

The strongest tradition in past research on classroom learning environment has involved investigation of the predictive validity of student perceptions (i.e., the ability to predict student cognitive, affective, and behavioural learning outcomes). Furthermore, the classroom environment instrument most widely employed in these predictive validity studies has been the fifteen-scale Learning Environment Inventory (LEI) (24, 25) which measures student perceptions of classroom Cohesiveness, Friction, Favoritism, Cliqueness, Satisfaction, Apathy, Speed, Difficulty, Competitiveness, Diversity, Formality, Material Environment, Goal Direction, Disorganization, and Democracy. Taken together prior research results provide convincing and consistent support for the predictive validity of students' classroom environment perceptions in accounting for appreciable amounts of variance in learning outcomes, often beyond that attributable to student characteristics such as pretest performance, general ability, or both.

A shorter simplified five-scale version of the LEI, called the My Class Inventory (MCI), has been available for use with eight to twelve year olds for almost a decade (24). Nevertheless, in contrast to the LEI, only relatively few studies have used the MCI and only limited evidence on the MCI's predictive validity is available. Consequently, the present study was undertaken to explore the predictability of some cognitive and affective outcomes from perceptions on the MCI among a large sample of 12 year-olds. Before describing the study itself, attention in the following sections is devoted to a review of past predictive validity studies and to prior research involving use of the MCI.

PRIOR PREDICTIVE VALIDITY STUDIES

Prior predictive validity studies span numerous different countries, grade levels, and subject areas and reflect numerous methodological variations including choice of classroom environment instrument, sample size, unit of statistical analysis, background variables controlled, and data analysis techniques. Much of the early predictive validity research was conducted as part of the research and evaluation activities of Harvard Project Physics, and involved the use of various versions of the LEI with senior high school classes in the U.S. In particular, support for the predictive validity of student perceptions came from Walberg and Anderson's (26) study of relationships between individual students' perceptions and individual outcome scores, Anderson and Walberg's (27) study of relationships between class mean

perceptions and class mean outcomes, and Anderson's (28) study of relationships between class mean environment perceptions and student individual learning. Using other data obtained from classes involved in the evaluation of Harvard Project Physics, Walberg (29, 30, 31) used a variety of units of analysis and other methodological variations to establish further the predictive validity of the LEI among senior high school physics classes in the U.S.

A wide variety of other studies has explored the predictive validity of versions of the LEI in various subject areas, at different grade levels, and in different cultures. These include Lorenz's (32) study of attitude outcomes among a random sample of 238 high school classes in the U.S., Fraser's (33, 34, 35) study of cognitive and attitudinal outcomes among Australian seventh graders, studies of achievement in Canada conducted by Walberg and Anderson (36) and O'Reilly (37), Hofstein and his colleagues' (38) study of some attitudinal outcomes in Israel, and Cort's (13) investigation involving social studies classes in the U.S.

Also some evidence supporting the cross-cultural predictive validity of translated versions of the LEI has come from studies in four developing countries. These are Walberg, Singh, and Rasher's (39) study of 83 science and 67 social science classes at the tenth grade level in India, Holsinger's (40, 41) study of cognitive learning and individual modernity among a sample of 2533 Grade 3 to 5 students in Brazil, Paige's (42) study of cognitive achievement and modernity among 60 sixth grade classes in Indonesia, and Chatiyanonda's (43) study of attitudes among 31 twelfth grade physics classes in Thailand.

The LEI is not the only instrument which has been used to investigate the predictive validity of students' perceptions of classroom learning environment. Moos has used the Classroom Environment Scale (44, 45) with various samples of junior high and high school classes in the U.S. to establish the relationship of classroom perceptions to student satisfactions and moods (46, 47), to student absences and grades (48), and to student reactions (49). Rentoul and Fraser (50) used the Individualized Classroom Environment Questionnaire (51) to establish significant associations between perceptions of classroom individualization and affective (but not cognitive) learning outcomes. Brookover (52, 53) found that U.S. elementary students' perceptions of five characteristics of the school environment were associated with academic achievement. McDill, Rigsby, and Meyers (54, 55) used factor-analytic scales based on Stern's instruments (56) with a sample of over 20,000 U.S. high school students to establish relationships between student perceptions and the outcomes of mathematics achievement and college plans. Modified versions of scales from Stern's College Characteristics Index have also been used by Gardner (57, 58) with Australian Grade 11 physics classes to reveal associations between student perceptions and several science-related attitudes.

The pattern emerging from the studies reviewed above is further highlighted in Haertel, Walberg, and Haertel's recent meta-analysis (6) involving 734 correlations obtained from 12 studies of 10 data sets in eight subject areas, encompassing 17,805 students in 823 classes in four nations. Learning outcomes were found to be positively associated with certain classroom environment dimensions (e.g., Cohesiveness, Satisfaction, Material Environment) and negatively associated with others (e.g., Friction, Apathy, Disorganization).

PREVIOUS USE OF MCI

The LEI has been shortened and simplified in three ways to form the MCI, which is designed for use with school children in the 8-12 years age range. First, in order to minimize fatigue among younger children during administration, the MCI has been shortened to contain only five of the LEI's original 15 scales (Cohesiveness, Friction, Difficulty, Satisfaction, and Competitiveness). Second the wording of

many original LEI items has been simplified to enhance readability for children at this age level. Third the LEI's four-point response format (Strongly Agree, Agree, Disagree, Strongly Disagree) has been changed in the MCI to a two-point response format (Yes, No) in order to make responding easier for 8-12 year olds.

In contrast to the voluminous amount of research conducted using the LEI, use of the MCI is reported only in a couple of published articles (14, 59) and a handful of unpublished fugitive documents (60, 61, 62, 63, 64, 65). Talmage and Walberg's (59, 66) study involving 1600 elementary students following a district reading program in Illinois revealed that the set of MCI dimensions accounted for a significant increment of 11 per cent in the variance in posttest reading achievement beyond that attributable to pretest reading scores. Talmage's use of the MCI in a curriculum evaluation study (60, 67) involving investigative approaches to mathematics teaching showed that a group variable (experimental/control) accounted for a significant increment in posttest Cohesiveness scores beyond that attributable to pretest Cohesiveness scores. Walberg, Sorenson, and Fishbach (68) reported the use of a classroom environment instrument similar to the MCI with a sample of 2677 American fifth graders in 40 different schools. Significant findings emerging from the study were complex but interesting; for example, the greater the fraction of higher SES children, the less competitive the higher SES children perceived the school, but the more competitive the lower SES children found it.

Further information about the predictive validity of MCI variables is provided in unpublished reports describing a large-scale research program in elementary schools in Georgia. This research involved students' perceptions of the school rather than the classroom and, consequently, the word "class" in MCI items was changed to "school". Ellett, Masters, and Pool (69) administered the MCI to a sample of 6151 fourth grade students in 89 different schools, and found that the five MCI dimensions together accounted for a significant amount of the variance in achievement (72 per cent) and attendance (14 per cent). Furthermore Perkins (70) found that student perceptions were still related to an outcome variate of achievement and attendance when teacher attitude was controlled. Ellett and Masters (71) investigated associations between student perceptions of the school environment as measured by the MCI and teacher perceptions of the school environment as measured by Coughlan and Cooke's (72) School Survey using a sample of 8461 students and 1695 teachers. One finding was that teachers' perceptions of worse administrative practices and better school-community relations and educational effectiveness were linked with student perceptions of lower friction and cohesiveness. The Georgia studies also involved an investigation (73) of associations between student perceptions as measured by the MCI and teacher competency. One of the interesting findings was that more competent teachers' classrooms were perceived by students as being characterized by greater satisfaction and less friction.

MODIFICATION OF THE ORIGINAL MCI

The amount of reliability and validity data available on the MCI is quite limited. The only information provided by Anderson (24) was an estimate of the reliability (type of coefficient unspecified) of each scale based on a sample of 655 individual elementary school students in the U.S. These estimates were 0.54 for Cohesiveness, 0.70 for Friction, 0.56 for Difficulty, 0.77 for Satisfaction, and 0.56 for Competitiveness. Because of the low value of the reliability of some scales, it was decided that, prior to the main study, an attempt would be made to enhance the reliability of MCI scales through the application of item analysis techniques. In fact, a secondary purpose of this article is to report some scale validation data based on the present large sample of over 2,000 students in 100 classrooms.

Prior to the main study, the original MCI was administered to a sample of 357 seventh grade students in 14 classes in six schools in Tasmania. Application of standard item analysis procedures led to the identification and subsequent removal of seven of the original 45 items. The reliability estimate (alpha coefficient) for the refined scales was found to be 0.63 for Cohesiveness, 0.68 for Friction, 0.68 for Difficulty, 0.76 for Satisfaction, and 0.72 for Competitiveness, which are higher than those obtained for the original version of the MCI by Anderson (0.54 to 0.77). Consequently, the modified version of the MCI was used in the main study.

The sample in the main study consisted of a large and representative group of 2305 seventh grade students in 100 science classrooms in 30 schools throughout Tasmania. The MCI was considered a suitable instrument for use at the seventh grade level both because prior research with junior high school students had revealed reading difficulties with the LEI (74), and because the MCI had been developed specifically for 8 to 12 year olds (and the average age of the present sample was 12 years). Also since the intact class and not the individual student was the primary sampling unit, it was decided to employ the class mean as the unit of statistical analysis (75, 76). The advantage of using the class mean in this context is that it satisfies the requirement of independence of observations (77).

Table 1 provides some descriptive information - namely, a sample item and the scale length - for each scale in the modified version of the MCI. Also Table 1 reports some scale validation data obtained using the class as the unit of statistical analysis with the sample of 100 classrooms. In particular, information is provided about scale internal consistency (using Shaycoft's (78) procedure to estimate reliability of class means from alpha coefficients obtained for individuals) and about scale discriminant validity (namely, the mean correlation of a scale with the other four scales calculated for class means). Data in Table 1 indicate that scale reliability estimates ranged from 0.90 to 0.96, thus indicating high internal consistency of each MCI scale when used with classes as the units of analysis. Table 1 also shows that the value of the mean correlation of a scale with the other scales ranged from 0.13 to 0.30, thus suggesting that the MCI measures distinct although somewhat overlapping dimensions of classroom environment.

Another desirable characteristic of any classroom environment scale is that it is capable of differentiating between the perceptions of students in different classrooms. That is, students within the same class should perceive their class relatively similarly, while mean within-class perceptions should vary from classroom to classroom. This characteristic was explored for each MCI scale with the present sample by performing a one-way ANOVA, with class membership as the main effect and using the individual as the unit of analysis, to obtain information about the ratio of between-class variance to within-class variance. The results of these analyses are shown in Table 1 which indicates that each MCI scale differentiated significantly ($p < .01$) between classrooms. Furthermore the eta^2 statistic, which is the ratio of between to total sums of squares (79), was calculated as an estimate of the amount of variance in MCI scores attributable to class membership. Table 1 shows that the proportion of variance accounted for by class membership ranged from 0.18 for the Difficulty scale to 0.31 for the Friction scale.

DESIGN OF MAIN STUDY

The main study involved administration of the modified version of the MCI to the large sample of science students toward the end of a school year. Also, in order to permit investigation of relationships between classroom environment and learning outcomes, two cognitive and one affective outcome

Table 1. Sample Item, Number of Items, Internal Consistency (Alpha Coefficient), Discriminant Validity (Mean Correlation with other Four Scales), and ANOVA Results (F and Eta^2) for Class Membership Differences for each MCI Scale

Scale	Descriptive Information		Scale Validation Statistics[a]		ANOVA Results	
	Sample Item	No. of Items	Alpha Rel.	Mean Correl. with Other Scales	F	Eta^2
Cohesiveness	Some people in my class are not my friends. (-)	6	0.94	0.27	2.5**	0.21
Friction	Many of the children in our class like to fight. (+)	8	0.94	0.30	4.1**	0.31
Difficulty	In our class the work is hard to do. (+)	8	0.90	0.20	2.0**	0.18
Satisfaction	Some pupils are not happy in the class. (-)	9	0.96	0.38	4.0**	0.30
Competitiveness	Most children want their work to be better than their friends' work. (+)	7	0.91	0.13	2.1**	0.19

Items designated (+) are scored 3 and 1, respectively, for responses Yes and No. Items designated (-) are scored in the reverse manner. Omitted or invalid responses are scored 2.

[a] Scale statistics were calculated using the class mean as the unit of analysis.

** $p < .01$

Table 2. Simple, Multiple, Semipartial Multiple, and Canonical Correlations (Using Raw Posttest and Residual Posttest Scores) between Three Learning Outcomes and Five MCI Scales

Learning Outcome Posttest	Simple Correlation, r					Multiple Correlation	Semipartial Multiple Correlation[a]
	Cohes.	Friction	Diffic.	Satis.	Compet.	R	sR
Scales	-0.09	-0.04	-0.23*	0.23*	0.02	0.35*	0.27*
Understanding of Nature of Science	-0.08	-0.18	-0.28**	0.21*	0.01	0.40**	0.25*
Interest in Science	0.13	-0.08	-0.29**	0.21*	0.18	0.35*	0.21
					Canonical Correlation:	R_c=0.46** (Raw posttest scores)	R_c=0.43* (Residual posttest scores[a])

* $p < .05$, ** $p < .01$

[a] Involves adjustment for corresponding pretest and general ability.

measures were administered both at the beginning and end of the same school year. The first cognitive outcome was the skill of reading various scales, and this was measured with a ten-item multiple choice scale (80) whose KR-20 reliability was reported to be 0.77 for a sample of 1158 individual seventh grade students in Australia. The second cognitive outcome was understanding of the nature of science, and this was measured with a 30-item multiple-choice scale (81) whose KR-20 reliability was reported to be 0.78 for the same sample. The attitude outcome was interest in science and this was measured with a six-item Likert-type scale (82) whose alpha reliability was found to be 0.79 with the same sample. Information on student general ability was obtained from school records.

ANALYSES AND RESULTS

A notable feature of prior research into the predictive validity of students' classroom environment perceptions is that a variety of different data analytic techniques has been used in exploring outcome-environment relationships. In the present research, it was decided to analyze data and report results in five different ways all involving the class mean as the unit of analysis (see Table 2).

The first and least complex analysis reported in Table 2 is a simple correlational analysis involving class mean scores on the three learning outcome posttests and the five MCI scales. Results indicate that six of the 15 correlations were significantly greater than zero ($p < .05$), which is eight times that expected by chance.

While a simple correlational analysis can provide useful information, the multiple correlation of the set of MCI scales with each outcome provides a more parsimonious picture of the joint influence of correlated environment dimensions on outcomes, and reduces the Type I error rate associated with the simple correlational analysis. Table 2 shows that the magnitude of the multiple correlation between a posttest outcome and set of classroom environment scales was 0.35 for Scales, 0.40 for Understanding of the Nature of Science, and 0.35 for Interest in Science, and that these values were significantly greater than zero ($p < .05$) for each learning outcome.

In prior research, it has been common to perform a conservative test of outcome-environment relationships by controlling statistically certain students' characteristics, especially corresponding pretest and general ability. That is, for reasons of simplicity, learning environment dimensions have been considered useful predictors of learning outcomes only if they accounted for different variance from that attributable to well-established predictors like pretest and general ability. The last column of figures in Table 2 shows the value of the semipartial multiple correlation between each outcome posttest and the set of five MCI scales obtained when the effects of both corresponding pretest performance and general ability were controlled. Although values of the semipartial multiple correlation (0.27, 0.25, and 0.21 for the three outcomes) are smaller than the values of the multiple correlation, they were still found to be significantly greater than zero ($p < .05$) for the two cognitive outcomes. Furthermore, since the square of the semipartial multiple correlation represents the increment in explained variance (79), it can be seen that the set of MCI scales accounted for an increment of between approximately four and seven per cent of the variance in different outcome posttests over and above that attributable to corresponding pretest and general ability.

Although the use of multiple correlations and semipartial multiple correlations overcomes the problem of colinearity between MCI scales, colinearity between outcome measures could still give rise to an inflated experimentwise Type I error rate. Canonical analysis, however, can provide a parsimonious

picture of relationships between a domain of correlated learning outcomes and a domain of correlated environment dimensions. Consequently two canonical analyses were conducted using the class mean as the unit of analysis. The first canonical analysis was analogous to the multiple correlational analysis in that it explored relationships between scores on the set of five environment scales and raw posttest scores on the set of three learning outcomes. The second canonical analysis was analogous to the semipartial multiple correlational analysis in that it explored relationships between scores on the set of five environment scales and residual posttest scores (i.e., scores residualized for corresponding pretest performance and general ability) on the three learning outcomes.

The bottom of Table 2 shows that each canonical analysis yielded one significant ($p < .05$) canonical relationship. A significant canonical correlation of 0.46 ($p < .01$) was found between environment scales and raw posttest scores, while a significant canonical correlation of 0.43 ($p < .05$) was found between environment scales and residual posttest scores.

Although the five separate analyses reported in Table 2 are consistent in that each provides support for the predictive validity of the MCI, each analysis leads to a somewhat different interpretation of relationships between individual outcomes and individual environment dimensions. An examination of the simple correlational analysis reported in Table 2 suggests that scores on each of the three outcomes were significantly higher in classrooms perceived as more satisfying and less difficult. In contrast, the most sophisticated analysis reported in Table 1 (i.e., the canonical analysis of residual posttest scores) revealed a somewhat different interpretation. An examination of canonical loadings suggested that, with corresponding pretest and general ability controlled, higher posttest scores on the two cognitive outcomes (but not the attitudinal outcome) were found in classrooms perceived as less difficult and less competitive.

CONCLUSION

This paper has described a study of the predictive validity of perceptions on a slightly modified version of the My Class Inventory (MCI) among a large sample of 2305 students in 100 classrooms. It was found that, for this sample, MCI scales displayed satisfactory internal consistency and discriminant validity, and that each MCI scale differentiated significantly between the perceptions of students in different classrooms. Relationships between a set of three learning outcomes (two cognitive and one attitudinal) and the set of five classroom environment scales contained in the MCI were explored using the class mean as the unit of analysis and different data analytic techniques (simple, multiple, semipartial multiple, and canonical analysis). Taken together the five different analyses provided much support for the predictive validity of student perceptions as measured by the MCI.

NOTE

A copy of the modified version of the My Class Inventory together with scoring instructions is obtainable from the first author at School of Education, Macquarie University, North Ryde, N.S.W. 2113, Australia.

REFERENCES

1. Walberg, H. J. "The psychology of learning environments: Behavioral, structural, or perceptual?" Review of Research in Education 4 (1976): 142-178.

2. Fraser, B. J. and Walberg, H. J. "Psychosocial learning environment in science classrooms: A review of research." Studies in Science Education. (in press)

3. Walberg, H. J. (ed.) Educational Environments and Effects: Evaluation, Policy, and Productivity. Berkeley: McCutchan, 1979.

4. Moos, R. H. Evaluating Educational Environments: Procedures, Measures, Findings and Policy Implications. San Francisco: Jossey-Bass, 1979.

5. Fraser, B. J. Learning Environment in Curriculum Evaluation: A Review. "Evaluation in Education: International Progress" Series, London: Pergamon, 1980. (in press)

6. Haertel, G. D., Walberg, H. J., and Haertel, E. H. "Social-psychological environments and learning: A quantitative synthesis." Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, April 1979.

7. Fraser, B. J. "Guest Editor's Introduction: Classroom Environment Research in the 1970's and 1980's." Studies in Educational Evaluation 6 (1980). (in press)

8. Anderson, G. J., Walberg, H. J., and Welch, W. W. "Curriculum effects on the social climate of learning: A new representation of discriminant functions." American Educational Research Journal 6 (1969): 315-327.

9. Welch, W. W., and Walberg, H. J. "A national experiment in curriculum evaluation." American Educational Research Journal 9 (1972): 373-383.

10. Fraser, B. J. "Evaluation of a science-based curriculum." In Educational Environments and Effects: Evaluation, Policy, and Productivity, edited by H. J. Walberg. Berkeley: McCutchan, 1979.

11. Tisher, R. P., and Power, C. N. "The learning environment associated with an Australian curriculum innovation." Journal of Curriculum Studies 10 (1978): 169-184.

12. Levin, T. "Classroom climate as criterion in evaluating individualized instruction in Israel." Studies in Educational Evaluation 6 (1980). (in press)

13. Cort, H. R., Jr. "A social studies evaluation." In Educational Environments and Effects: Evaluation, Policy, and Productivity, edited by H. J. Walberg. Berkeley: McCutchan, 1979.

14. Talmage, H., and Hart, A. "A study of investigative teaching of mathematics and effects on the classroom learning environment." Journal of Research in Mathematics Education 8 (1977): 345-358.

15. Walberg, H. J. "Class size and the social environment of learning." Human Relations 22 (1969): 465-475.

16. Anderson, G. J., and Walberg, H. J. "Class size and the social environment of learning: A mixed replication and extension." Alberta Journal of Educational Research 18 (1972): 277-286.

17. Randhawa, B. S., and Michayluk, J. O. "Learning environment in rural and urban classrooms." American Educational Research Journal 12 (1975): 265-285.

18. Welch, W. W. "Curricular and longitudinal effects on learning environments." In Educational Environments and Effects: Evaluation, Policy, and Productivity, edited by H. J. Walberg. Berkeley: McCutchan, 1979.

19. Anderson, G. J. "Effects of course content and teacher sex on the social climate of learning." American Educational Research Journal 8 (1971): 649-663.

20. Steele, J. M., Walberg, H. J., and House, E. R. "Subject areas and cognitive press." Journal of Educational Psychology 66 (1974): 363-366.

21. Kuert, W. P. "Curricular structure." In Educational Environments and Effects: Evaluation, Policy, and Productivity, edited by H. J. Walberg. Berkeley: McCutchan, 1979.

22. Hearn, J. C., and Moos, R. H. "Subject matter and classroom climate: A test of Holland's environmental propositions." American Educational Research Journal 15 (1978): 111-124.

23. Trickett, E. J. "Toward a social-ecological conception of adolescent socialization: Normative data on contrasting types of public school classrooms." Child Development 49 (1978): 408-414.

24. Anderson, G. J. "The assessment of learning environments: A manual for the Learning Environment Inventory and the My Class Inventory." Unpublished document, Atlantic Institute of Education, Halifax, 1971.

25. Anderson, G. J., and Walberg, H. J. "Learning environments." In Evaluating Educational Performance: A Sourcebook of Methods, Instruments, and Examples, edited by H. J. Walberg. Berkeley: McCutchan, 1974.

26. Walberg, H. J., and Anderson, G. J. "Classroom climate and individual learning." Journal of Educational Psychology 59 (1968): 414-419.

27. Anderson, G. J., and Walberg, H. J. "Classroom climate and group learning." International Journal of Educational Sciences 2 (1968): 175-180.

28. Anderson, G. J. "Effects of classroom social climate on individual learning." American Educational Research Journal 7 (1970): 135-152.

29. Walberg, H. J. "Predicting class learning: An approach to the class as a social system." American Educational Research Journal 6 (1969): 529-542.

30. Walberg, H. J. "The social environment as mediator of classroom learning." Journal of Educational Psychology 60 (1969): 443-448.

31. Walberg, H. J. "Social environment and individual learning: A test of the Bloom model." Journal of Educational Psychology 63 (1972): 69-73.

32. Lawrenz, F. "The prediction of student attitude toward science from student perception of the classroom learning environment." Journal of Research in Science Teaching 13 (1976): 509-515.

33. Fraser, B. J. "Evaluation of a science-based curriculum." In Educational Environments and Effects: Evaluation, Policy, and Productivity, edited by H.J. Walberg. Berkeley: McCutchan, 1979.

34. Fraser, B. J. "Environmental factors affecting attitude toward different sources of scientific information." Journal of Research in Science Teaching 15 (1978): 491-497.

35. Fraser, B. J. "Classroom climate as predictor and criterion in science education research." Research in Science Education 6 (1976): 109-120.

36. Walberg, H. J., and Anderson, G.J. "Properties of the achieving urban class." Journal of Educational Psychology 63 (1972): 381-385.

37. O'Reilly, R. O. "Classroom climate and achievement in secondary school mathematics classes." Alberta Journal of Educational Research 21 (1975): 241-248.

38. Hofstein, A., Gluzman, R., Ben-Zvi, R., and Samuel, D. "Classroom learning environment and student attitudes towards chemistry." Studies in Educational Evaluation 5 (1979): 231-236.

39. Walberg, H. J., Singh, R., and Rasher, S. P. "Predictive validity of student perceptions: A cross-cultural replication." American Educational Research Journal 14 (1977): 45-49.

40. Holsinger, D. B. "The elementary school as an early socializer of modern values: A Brazilian study." Unpublished doctoral dissertation, Stanford University, 1972.

41. Holsinger, D. B. "The elementary school as modernizer: A Brazilian study." International Journal of Comparative Sociology 14 (1973): 180-202.

42. Paige, R. M. "The impact of the classroom learning environment on academic achievement and individual modernity in East Java, Indonesia." Unpublished doctoral dissertation, Stanford University, 1978.

43. Chatiyanonda, S. "An evaluation of the IPST physics curriculum in Thailand." Unpublished PhD thesis, Monash University, Melbourne, 1978.

44. Trickett, E. J., and Moos, R. H. "Social environment of junior high and high school classrooms." Journal of Educational Psychology 65 (1973): 93-102.

45. Moos, R. H., and Trickett, E. J. Classroom Environment Scale Manual. Palo Alto: Consulting Psychologists Press, 1974.

46. Trickett, E. J., and Moos, R. H. "Personal correlates of contrasting environments: Student satisfactions in high school classrooms." American Journal of Community Psychology 2 (1974): 1-12.

47. Moos, R. H. "A typology of junior high and high school classrooms." American Educational Research Journal 15 (1978): 53-66.

48. Moos, R. H., and Moos, B. S. "Classroom social climate and student absences and grades." Journal of Educational Psychology 70 (1978): 263-269.

49. Moos, R. H. Evaluating Educational Environments: Procedures, Measures, Findings and Policy Implications. San Francisco: Jossey-Bass, 1979.

50. Rentoul, A. J., and Fraser, B. J. "Predicting learning from classroom individualization and actual-preferred congruence." Studies in Educational Evaluation 6 (1980). (in press)

51. Rentoul, A. J., and Fraser, B. J. "Conceptualization of enquiry-based or open classroom learning environments." Journal of Curriculum Studies 11 (1979): 233-245.

52. Brookover, W. B., and Schneider, J. "Academic environments and elementary school achievement." Journal of Research and Development in Education 9 (1975): 83-91.

53. Brookover, W. B., Schweitzer, J. H., Schneider, J. M., Beady, C. H., Flood, P. K. and Wisenbaker, J. M. "Elementary school social climate and school achievement. American Educational Research Journal 15 (1978): 301-318.

54. McDill, E. L., Rigsby, L. C., and Meyers, E. D., Jr. "Institutional effects on the academic behavior of high school students." Sociology of Education 40 (1967): 181-199.

55. McDill, E. L., Rigsby, L. C., and Meyers, E. D., Jr. "Educational climates of high schools: Their effects and sources." American Journal of Sociology 74 (1969): 567-586.

56. Stern, G. G. People in Context: Measuring Person-Environment Congruence in Education and Industry. New York: Wiley, 1970.

57. Gardner, P. L. "Pupil personality, teacher behaviour and attitudes to a physics course." In Contemporary Studies in the Curriculum, edited by P. W. Musgrave. Sydney: Angus and Robertson, 1974.

58. Gardner, P. L. "Attitudes toward physics: Personal and environmental influences." Journal of Research in Science Teaching 13 (1976): 111-125.

59. Talmage, H., and Walberg, H. J. "Naturalistic decision-oriented evaluation of a district reading program." Journal of Reading Behavior 10 (1978): 185-195.

60. Walberg, H. J., and Anderson, G. J. "The evaluation of a Title I project using the My Class Inventory." Unpublished paper, Harvard University, 1968.

61. Cayne, R. E. "Relationships of teacher personality to classroom social climates." AERA Abstracts 40 (1970).

62. Walberg, H. J. "An evaluation of an urban-suburban bussing program: Student achievement and perception of class learning environments." Unpublished report, Metropolitan Council on Educational Opportunity, Boston, Mass., 1970.

63. Jung, H. "Study of Project Plan using the My Class Inventory." Unpublished document, University of Wisconsin, 1971.

64. Maguire, T. O., Goetz, E., and Manos, J. "Evaluation activities of the IPI Project Year 2: The evaluation of two instruments for assessing classroom climate for primary grades." Unpublished paper, Alberta Human Resources Research Council, Alberta, 1972.

65. Payne, D. A., Ellett, C. A., Perkins, M. L., Klein, A. E., and Shellinberger, S. "The verification and validation of principal competencies and performance indicators." Unpublished final report of Results Oriented Management in Education (R.O.M.E.) project, University of Georgia, 1974-75.

66. Talmage, H., and Walberg, H. J. "Pilot reading series evaluation study: Final report." Unpublished document, Office of Evaluation Research, University of Illinois at Chicago Circle, 1974.

67. Talmage, H., and Eash, M. J. "A paradigm for designing evaluation studies of three determinants of the classroom learning environment: Curriculum, instruction, and instructional materials." Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, April 1978.

68. Walberg, H. J., Sorenson, J., and Fishbach, T. "Ecological correlates of ambience in the learning environment." American Educational Research Journal 9 (1972): 139-148.

69. Ellett, C. D., Masters, J. A., and Pool, J. E. "The incremental validity of teacher and student perceptions of school environment characteristics." Paper presented to the Annual Meeting of the Georgia Educational Research Association, Atlanta, January 1978.

70. Perkins, M. L. "Canonical correlational analyses of the relationships among school climate, teacher morale, and the educationally relevant performance of fourth grade students." Unpublished doctoral dissertation, University of Georgia, 1976.

71. Ellett, C. D., and Masters, J. A. "Learning environment perception: Teacher and student relations." Paper presented to the Annual Convention of the American Psychological Association, Toronto, August 1978.

72. Coughlan, R. J., and Cooke, R. A. "Work attitudes." In Evaluating Educational Performance: A Sourcebook of Methods, Instruments, and Examples, edited by H. J. Walberg. Berkeley: McCutchan, 1974.

73. Ellett, C. D., Capie, W., Okey, J. R., and Johnson, C. E. "Validating the Teacher Performance Assessment Instruments against student perceptions of school climate/learning environment characteristics." Unpublished paper, Teacher Assessment Project, University of Georgia, December 1978.

74. Power, C. N., and Tisher, R. P. "Variations in the environment of self-paced science classrooms: Their nature, determinants, and effects." Paper presented to the Annual Conference of the Australian Association for Research in Education, Adelaide, November 1975.

75. Sirotnik, K. A. "Psychometric implications of the unit-of-analysis "problem" (with examples from the measurement of organizational climate)." Unpublished technical report, Institute for Development of Educational Activities, Los Angeles, July 1979.

76. Ross, K. N. "Sample design for educational survey research." Evaluation in Education: International Progress 2 (1978). (whole issue)

77. Peckham, P. D., Glass, G. V., and Hopkins, K. D. "The experimental unit in statistical analysis: Comparative experiments with intact groups." Journal of Special Education 3 (1969): 337-349.

78. Shaycoft, M. F. "The statistical characteristics of school means." In Studies of the American High School, edited by J. C. Flanagan, J. T. Dailey, M. F. Shaycoft, D. B. Orr, and I. Goldberg. Pittsburgh: University of Pittsburgh, 1962.

79. Cohen, J., and Cohen, P. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. New York: Wiley, 1975.

80. Fraser, B. J. Test of Enquiry Skills. Melbourne: Australian Council for Educational Research, 1979.

81. Fraser, B. J. "Developing Subscales for a Measure of Student Understanding of Science." Journal of Research in Science Teaching 15 (1978): 79-84.

82. Fraser, B. J. "Selection and validation of attitude scales for curriculum evaluation." Science Education 61 (1977): 317-329.

TRANSITION EDUCATION: A CASE STUDY IN THE STATE'S RESPONSE TO YOUTH UNEMPLOYMENT

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INTRODUCTION

The question of schooling's relation to youth unemployment has dominated both academic and political debate about education for the past five years - so much so that one is tempted to ask just what more can be said without being retetitive and boring. There has been a multiplicity of official reports and discussion papers (see Table I), to say nothing of books and articles, covering the by now familiar territory and generally drawing similar conclusions. There exists a confusing array of government schemes and programs focussing on youth unemployment and school to work transition (see Table II). There has also been an expanding critical response to those reports, schemes and programs (Encel, 1979; Freeland, 1980; Freeland & Sharp, 1979 & 1980; Gallagher, 1979(a) & 1979(b); McLaren, 1979; ans Wilson, 1979).

TABLE I

REPORTS RELATING TO YOUTH UNEMPLOYMENT AND SCHOOL TO WORK TRANSITION

Fitzgerald, R.T. Commission of Inquiry into Poverty, Poverty and Education in Australia, Canberra, AGPS, 1976

Commission of Inquiry into Poverty, School Leavers: Choice and Opportunity, Canberra, AGPS, 1977

Australian Education Council Working Party, Transition from School to Work or Further Study, First Report, Canberra, AGPS, 1977

Australian Schools Commission, School and Work: a Discussion Paper, Canberra, Australian Schools Commission, 1977

Office of Youth Affairs, Youth Unemployment and School/Work Transition, Youth Information Series No. 1, Canberra, AGPS, 1977

O.E.C.D., Report of the Joint Working Party on Education and Working Life, Paris, 1977

Commission of Inquiry into Poverty, School, Community and Work: Urban and Rural Aspects, Canberra, AGPS, 1978

Commonwealth Department of Education, Education Program for Unemployed Youth: initial evaluation of pilot phase, Canberra, AGPS, 1978

Committee of Inquiry into Education and Training, Education, Training and Employment, (the Williams Report), Canberra, 1979

Australian Education Council Working Party, Transition from School to Work or Further Study, Second Report, Canberra, AGPS, 1979

Hubbert, G.D. Commonwealth Department of Education, An Evaluation of the Education Program for Unemployed Youth, Canberra, AGPS, 1980

TABLE II

PROGRAMS RELATING TO YOUTH UNEMPLOYMENT AND SCHOOL TO WORK TRANSITION

PROGRAM	RESPONSIBLE DEPARTMENT	DATE STARTED
National Employment & Training Scheme (NEAT)	Employment & Youth Affairs	Oct, 1974
Group One-Year Apprenticeship Scheme	Employment & Youth Affairs	1975
Special Youth Employment Training Program (SYETP)	NEAT in Employment & Youth Affairs	Oct, 1976
Fares Assistance Scheme (FAS) & Reallocation Assistance Scheme	Employment & Youth Affairs	Oct, 1976
Community Youth Support Scheme (CYSS)	Employment & Youth Affairs	Nov, 1976
Commonwealth Rebate for Apprentice Full-time Training (CRAFT)	Employment & Youth Affairs	Jan, 1977
Education Program for Unemployed Youth (EPUY)	C'wealth Education, Employment & Youth Affairs, Social Security, and State Education Departments	July 1977
National Employment Strategy for Aboriginals (NESA)	Employment & Youth Affairs, and C'wealth & State Aboriginal Affairs	
Special NEAT Projects for Handicapped Youth	Employment & Youth Affairs	1978
National Transition Education Scheme (Transed)	C'wealth & State Education, and Employment & Youth Affairs	Nov, 1979

However, some things need to be repeated and more analysis is required. A significant proportion of the writings and debate about the issue lacks a coherently developed analysis of the relationship between the state, the economy and schooling. This deficiency is evidenced in the educational programs for unemployed youth, all of which emphasise the development of individual's skills and attitudes. This approach can at most increase labour market competitiveness for some at the expense of others, and ignores the Williams Report's warning that "the solution to the youth unemployment problem is dependent on the solution to the general unemployment problem" (Vol.1:117). The objective of this paper is to briefly outline the essentials of an analysis of schooling as it relates to unemployment (the labour market) and the state, and to critically analyse two government programs: the Education Program for Unemployed Youth (EPUY) and Transed, the combined Federal and State program designed to identify and assist those students and school leavers most at risk. In so doing an attempt will be made to avoid a dangerously negative pessimism by emphasing avenues for positive action.

RESTATING THE ESSENTIALS

The first necessity is to differentiate between the subjective understanding and intentions of people involved both in the broad debate about education and in the practice of schooling, and the more objective analysis of the structural imperatives underlying the debate and its consequences. The subjective experience of an employer may lead him/her to a conviction that school standards have declined and that this is the major cause of youth unemployment. From this conviction emerge a series

of public attacks on the school system. It would be a mistake, however, to dismiss these attacks on the grounds that all evidence indicates a maintenance of school standards. Underlying the attacks is the question of the structural relationship between the schooling system and the labour market: a relationship which has undergone significant change in the past decade.

Structural and technological change have combined to drastically reduce employment in the manufacturing sector and severely curtail employment growth in the tertiary sector; to eradicate many semi- and un-skilled jobs; to reduce apprenticeship training; and to proportionately expand part-time work opportunities at the expense of full-time work. These changes have had their greatest impact among the young and more particularly among the early school leavers. The structures and processes of schooling have also changed. Through the first half of the seventies (the golden age of Karmelot) liberal progressive educational ideology attained a dominance in the debate about schooling and in practice there was a move towards a social democratic settlement (Allwood, 1975; Campbell, et al, 1976; D'Cruz & Sheehan, 1978; Finn, Grant & Johnson, 1978; and Fitzgerald, 1975). These changes were a by-product of the long post-war economic boom and education was generally seen as a force for social reform: the humanising of the school being seen as a model for humanising the work-place. However, the reforms came too late and are basically incompatible with the economic and political demands made on schooling in a period of prolonged recession. The early seventies concern for equality of opportunity has given way to an equally strong concern for quality and efficiency with the criteria for judgement being the fit between the products of schools and the labour market. There is thus a mismatch between the structures and processes of schooling in Karmelot and the post-boom demands being made by industry. This has led to the political and ideological attacks on schooling: attacks which conceal "a much wider process of reorganising the roles of the state and industry in the preparation of young workers" (Frith, 1979:8). Schools are not the source of youth unemployment and they are not the source of the educational crisis, but new demands are being made on the schooling system and changes are being effected. Thus, although the attacks may be based on a subjective misunderstanding of the real situation, to the extent that they gain currency and credibility legitimacy is provided for structural changes and financial cutbacks in education (Bannister, et al, 1979).

So long as large scale youth unemployment exists demands will be made on schools both to act as a sponge to disguise its existence, and to integrate a direct job training function. Given the reality of these demands and the concomitant changes being made, it is important to develop an understanding of just what schools are capable of achieving with regard to preparing future workers for the labour market. Only then can the worth of special education programs for youth at risk be assessed.

SCHOOLING'S CONTRADICTORY ROLE

Continued growth is central to capitalism's survival. The individual firm or multinational corporation must grow if it is to secure its continued existence and to grow it must maximise profits, and at the national level economic growth is the essential basis for the continued legitimation of a society's economic, political and social structures. A capitalist society can not maximise everybody's wellbeing: to expand labour's share of the G.D.P. (wages and salaries) as did the Whitlam Government, means to reduce the proportion going to profits, rent and interest, thus reducing the rate of capital investment and concomitantly, the rate of growth. Conversely, to increase capital's share of G.D.P. with a view to expanding investment, as the Fraser Government is doing, necessitates a reduction in labour's share and, in periods of low growth in G.D.P., a reduction in the real value of wages and salaries. Similarly, to redirect government expenditure away from the social wage area (health, welfare, education, etc.) and towards incentives for capital investment, as the Fraser Government is doing (Jones, 1979), is to reduce the quality of life of wage and salary earners. Sustained economic growth, at a rate higher than population growth, is the only means of disguising this reality and hence the key to legitimating the inherently exploitative relations of production.

Capitalism is not however, a purely economic system. It is simultaneously structured and defined by political and ideological factors as well as by economic factors, and the economic factor does not mechanically determine political and ideological developments. All that can be said is that capitalism has inherent imperatives (such as continued growth) and tendencies which work to impose limitations on, for example, the actions of the state. Thus, in a period of recession the degree of flexibility and freedom enjoyed by the state is somewhat less than that enjoyed in periods of economic boom. We therefore find a tendency for the social wage to expand in times of boom (the bargaining strength of the political and industrial arms of the labour movement being greater), and to contract in times of recession (the demands of industry attaining a dominance over those of labour).

This structural imperative has a direct relevance for schooling in Australia today. With the historical emergence of the industrial mode of production the family became increasingly incapable of ensuring the reproduction and allocation of workers for the increasingly specialised, divided and segmented labour market. Equally, the emerging capitalist enterprises operating in the anarchic free market were unable to provide adequately for the reproduction and control of the work force. It was in this context that universal schooling developed (Bowles & Gintis, 1976; McCann, ed, 1977; and Simon, 1974). The state, through the provision of universal schooling, has socialised the costs of social and cultural reproduction (which incorporates the reproduction of the workforce), but this necessary expense concomitantly acts as a drain on the rate of economic expansion and capital accumulation. Expenditure on education is unproductive in that it does not directly facilitate profit making.

Thus the capitalist state is characterised by an unavoidable contradiction: on the one hand it has to secure optimum conditions for accumulation, conditions which include provision for maximum capital investment, and on the other hand the state has to secure, through the provision of schooling (and family support, health and welfare services, etc.), the social and cultural reproduction of the workforce, and this necessarily acts as a drain on funds available for investment. In periods of recession this contradiction is exacerbated by the need for the state to facilitate fundamental restructuring of the economy. This requires a reduction in expenditure on the social wage which includes education. The Fraser Government is presently doing this. By cutting expenditure on schooling (and health, welfare, etc.) the cost of work force maintenance and reproduction is reduced, the necessary drain in investable funds is reduced. These savings can then be redistributed by the government to stimulate directly productive investment (Freeland & Sharp, 1979).

However, the contradictions of educational expenditure do not end here. While schooling does not directly produce profit, it does have a variable indirect impact on the amount of profit which can be extracted from investment: educational expenditure can be indirectly productive and thereby indirectly counter the necessary drain on funds available for investment and accumulation. To the extent that schooling enhances the basic skill training and work oriented attitudes of potential workers, increased productivity will counter the increased costs of work force maintenance and reproduction. Similarly, an increased emphasis on scientific and technological training can result in more efficient technology and hence increased productivity. A concentration on these areas of schooling can thus counter the tendency for the rate of profit to fall and boost the rate of accumulation.

Continued technological innovation and the concomitant increased productivity produces a relative surplus population (unemployment) which must be absorbed (through reduced hours of work, reduced retirement age and through delayed entrance into the labour market) to maintain social cohesion. However, the cost of increasing school retention rates (and reduced hours of work without an equivalent reduction in pay) produces an additional drain on directly profitable investment funds, thus hampering accumulation. This increases pressures to make schooling more efficient in terms of enhancing labour's productivity. The rate of profit is revived, accumulation safeguarded, but at the cost of an increase in "technological" unemployment, expansion of schooling as a means of social control, and a further drain on profitability and accumulation, and so on. There is no way in which this contradiction can be avoided in the capitalist system - it only can be reproduced.

Moreover, it is this contradiction which explains the present ideological attacks on, the financial cutbacks in schooling, and the concern, so evident in the Williams Report, for quality and efficiency in all levels of schooling (Vol. I, Chap. 18). The present recession has made this contradiction particularly glaring. High level, long

term structural unemployment among youth has disrupted the process of work force maintenance and reproduction. Reproduction is not complete until the potential worker finds employment and the longer the period of transition from school to work, the more "unemployable" the person becomes. Schooling significantly contributes to the development of "appropriate" work attitudes, but unemployment increasingly negates the lessons of schooling, produces a counter-work culture, and legitimation becomes problematic. Further, dole payments by the state act as a drain on accumulation, there being no productive return from the unemployed.

The state's political response to this situation is to place renewed emphasis on careers education, the basics (with the concomitant pedagogy), technical training, labour market planning and work experience programs to make school leavers more attuned to the demands of industry. Simultaneously, there are moves to increase the school retention rate and develop an alternative institutional apparatus to maintain youth in a state of suspended readiness for work (for example, CYSS and EPUY). On November 22, 1979, the then Minister for Education, Senator Carrick, and the Minister for Employment and Youth Affairs, Mr. Viner, effectively encapsulated this reaction when they jointly announced the provision of $150 million over five years for the Transed program:

> The aim of the Commonwealth's policy is that ultimately all young people in the 15-19 age group would be provided with options in education, training and employment, or any combination of these, either part-time or full-time, so that unemployment becomes the least acceptable alternative.

In so doing, the state must seek to minimise the costs of such provision and this the present federal government has sought to do - often to the detriment of the unemployed themselves (see Table III). *With regard to schooling, the state is faced with the necessity of schooling a greater number of people for longer periods of time, and to do so more efficiently (more productively) but with less money.*

TABLE III

EXPENDITURE ON EMPLOYMENT TRAINING PROGRAMS: 1978/79 - 1980/81

SCHEME	1978-1979 ACTUAL	1979-1980 ACTUAL	1979-1980 CHANGE	1980-1981 ESTIMATE	1980-1981 CHANGE	TOTAL CHANGE
NEAT	117.8	52.2	-65.6	60.92	+8.72	-56.88
SYETP	82.6	25.5	-57.1	30.1	+4.6	-52.5
CRAFT	28.4	42.7	+14.3	56.5	+13.8	+28.1
CYSS	10.7	11.6	+0.9	11.6	-	+0.9
EPUY	3.1	3.7	+0.6	4.0	+0.3	+0.9
G'ovt employment of surplus apprentices	6.0	0.8	-5.2	-	-0.8	-6.0
Group One Year Training Scheme	1.3	1.4	+0.1	1.5	+0.1	+0.2
National Apprenticeship Assistance Scheme	0.3	-	-0.3			-0.3
Transed		4.5 (1980 15.6)	+4.5	33.9	+29.4	+33.9 *
TOTAL CHANGE	167.6	116.9	-50.7	168.42	+51.52	+ 0.82

* It has been estimated that the Commonwealth could save up to $1.85 million a week by transferring youth from the dole to unpaid training schemes.

That schooling structures and processes are being restructured is apparent, and the final restructuring will be within the parameters imposed by the structural logic of capitalism's social (economic, political and ideological) relations and of the accumulation process. It would be a mistake, however, to see the restructuring as predetermined in all details. The state is not a monolith faithfully implementing that which is "best" for the interests of capital. Moreover, the interests of capital in general are far from clear and unproblematic in that there exist substantial differences between that which is "best" for different sections and fractions of capital (see, for example, Bowden, 1980). The state has a degree of independence from the various fractions of capital and capital in general, as it does from labour, and has to make political responses to demands placed on it by a variety of interest groups which include the various sections of industry. Further, the fragmented and disjointed nature of the state (Federal/State/Local; inter-Departmental rivalry; and elected government/bureaucracy relations) imposes limitations on its capacity to realise the full letter of its political decisions.

By analysing these limitations, and the processes of political decision making and policy implementation,as they relate to EPUY and Transed, it is possible to access the validity of the foregoing theoretical analysis and to indicate points at which positive interventions can be made.

THE EDUCATION PROGRAM FOR UNEMPLOYED YOUTH

In October 1976 Senator Carrick, then Fedaral Minister for Education, initiated discussions with the Chairman of the Technical and Further Education Commission and senior officers of the then Department of Employment and Industrial Relations, "with a view to an appropriate educational program being developed to assist the young unemployed whose low or inadequate educational qualifications were inhibiting them from obtaining stable employment". The initial political response had been made and it set in train a complex process of program definition and implementation.

Program initiation and implementation required the co-operation of both Commonwealth and State governments and a multitude of Commonwealth and State Departments. Negotiations with State TAFE authorities led to a proposal being submitted to Federal Cabinet in January 1977. Cabinet agreed to fund a trial program in 1977 ($1.5million) if the agreement and co-operation of the State Education Ministers could be obtained. This was secured at the February meeting of the Australian Education Council (AEC). The Commonwealth Department of Education assumed responsibility for broad policy development, funding and overall co-ordination, but the funds were to be made available to State TAFE authorities for administration and the same authorities were made responsible for course development, conduct and administration within the Commonwealth established guidelines. The Department of Employment and Industrial Relations was made responsible for advising on locations for EPUY courses, the advice being based on labour

market considerations, and the CES, within Employment and Industrial Relations, was to help in the identification of potential students. The payment of allowances (the unemployment benefit plus $6 a week travel allowance) to the students was made the responsibility of the Social Security Department out of the total NEAT allocation administered by the Department of Employment and Industrial Relations.

At the State level Steering Committees were established to foster and develop the program. In all State these committees comprised representatives of the Commonwealth Education Department, Employment and Industrial Relations, and State TAFE authorities. Private sector employers are represented on the Queensland committee. The first EPUY course started in July 1977.

Thus, from the stage of recognising a problem to which there had to be a political response, to the stage of course implementation at specific TAFE colleges, there are many points at which refractions of the initial government intentions and plans are likely to occur. These refractions have occurred and are presented in Tables IV and V.

TABLE IV

ADMINISTRATION LEVEL REFRACTIONS IN EPUY IN FOUR STATES

CHARACTERISTIC	QUEENSLAND	NEW SOUTH WALES	VICTORIA	SOUTH AUSTRALIA
Role of State Steering C'ttee	Advisory	Executive	Executive	Advisory
Role of State Co-ordinator	Minor	Major	Major	Major
Cost per participant per week	$105	$70	$85	$70
Total cost per participant	$1,680	$420	$1,200	$1,400
Duration of Programs	16 weeks	Most 6, some 12	12-20 weeks	20 weeks
Full-time staff	Rare	None	Some	Most
TAFE staff	About half	About half	Some	None
Staff development	No	Yes	Yes	Yes
State syllabus	Yes	Yes	No	Yes
Physical facilities	TAFE College	TAFE College	Most non-institutionalised	All non-institutionalised
Av. no. participants	15	15	14	28
Participant/staff ratio	7.1	10.7	5.6	7.8

SOURCE: Hubbert, 1980.

These Tables clearly illustrate that the full letter of political decisions at the highest levels can not be and are not implemented, and Hubbert (1980:65) explained these refractions as follows:

> Different emphases may be placed on each of the stated (Commonwealth) objectives, or individual programs may have discovered that, for their particular client group, further objectives must be achieved before it is possible to obtain improvement in the areas specified by the stated objectives.

Moreover, the existence of the refractions indicate that it is possible, if it is required, for strategic interventions to be made. Whether or not it is required can only be determined by an examination of the nature of EPUY courses, with a view to teasing out the underlying assumptions, and of the success or otherwise of EPUY courses.

TABLE V

COURSE LEVEL REFRACTIONS OF COMMONWEALTH'S EPUY GUIDELINES

COMMONWEALTH'S GUIDELINES

"The major objective of the program is to improve the employability of participants and that it is expected that this will be achieved by improving:

- levels of literacy
- levels of numeracy
- self-confidence
- attitudes towards work and employment
- levels of job seeking skills
- levels of other negotiable skills

"There is no objection to additional areas (e.g. recreational skills, the rights of the citizen) being included, but a course will not be approved if such items are emphasised to the detriment of the basic elements."

COURSE CO-ORDINATORS' OBJECTIVES

COMBINED STATES*	QUEENSLAND*	NEW SOUTH WALES*	VICTORIA*	SOUTH AUSTRALIA*
Self-confidence	Self-confidence	Self-confidence	Self-confidence	Self-confidence
Motivation	Motivation	Motivation	Motivation	Literacy
Human relationship skills	Job holding skills	Human relationship skills	Human relationship skills	Motivation
Job holding skills	New job skills	Job holding skills	Supportive environment	Numeracy
Literacy	Human relationship skills	Help cope with unemployment	Help cope with unemployment	Job knowledge
Help cope with unemployment	Job knowledge	Help find job	Literacy	Job holding skills
Provide supportive environment	Help cope with unemployment	Supportive environment	Job Knowledge	Help cope with unemployment
Improve job knowledge	Supportive environment	Literacy	Numeracy	Human relationship skills
Numeracy	Social awareness	Numeracy	Social awareness	Supportive environment
Social awareness	Literacy	Social awareness	Job holding skills	Social awareness
Help find job				
Develop new job skills				
Provide new friendships				

* Objectives as defined by course co-ordinators, not State Co-ordinators

SOURCE: Hubbert, 1980

The underlying direction of all existing education programs for unemployed youth are evident in the way the problem is defined, and the dominant definition is couched in individualistic terms. The emphasis, in public statements by employers and politicians, is on the unemployeds' lack of experience, maturity, basic skills in literacy and numeracy, job application and job specific skills, a lack of social confidence and competence, and a lack of conventional attitudes (Williams Report, I:88, 605 & 617). EPUY, "specifically designed for the young unemployed who have educational qualifications which are low or inadequate in today's labour market conditions" (Commonwealth Record, 7-13 Feb. 1977), and designed to "bring closer together the training provided in the education system and the demands of the labour market" (ibid), has been strongly influenced by this individualistic definition of the problem. To the extent that 47% of all unemployed juniors in 1976 had not gone beyond year nine at school, and that one quarter of unemployed males and one third of unemployed females had had no previous job experience in 1976, such a definition would appear justified. Thus the official Commonwealth guidelines emphasise improving levels of literacy, numeracy, self confidence, job seeking skills, other negotiable skills, and improving attitudes towards work and employment.

This basic orientation is reinforced by the present Federal Government's ideological and political opposition to job creation schemes and Government financed development schemes. Having thus rejected these partial solutions to the problem of unemployment, the only avenue of action (and some action is politically necessary) is that of focussing on individual skill and attitude development. Education programs based on this approach do not, however, significantly affect the job prospects of the clients: 66% of EPUY graduates do not find employment and a further 8% loose the job they find, a 26% success rate (in N.S.W. the success rate is 20%) (Hubbert, 1980:194). Moreover, in a stagnant job market those who are successful are replaced by those they successfully compete against - the unemployment is recycled but it remains.

Self confidence, human relationship skills, motivation and a supportive environment (the course elements injected by EPUY course co-ordinators) are all essential ingredients for coping with living on the dole. However, in and by themselves, and as they are related to other elements of EPUY courses, they endorse an individualistic definition of the problem and solution. For those EPUY participants who fail to acquire a job the courses serve to scapegoat the victim. They enter the program expecting a positive outcome. What they get is a number of coping skills which can be utilised in the battle to preserve self identity and dignity through a further extended period on the dole. These coping skills will be pitted against the repeated dejection resulting from failed job applications, failures seen by themselves and society as personal failures.

From this it can be concluded that the dominant definition of the problem and solution, the individualistic definition, must be de-legitimised on the grounds that courses based on that definition are primarily directed towards producing docile office, factory and shop fodder (objectives which are antithetical to liberal/progressive educational objectives); and because they ultimately serve to reinforce the scapegoating of the victim. Second, it can be concluded that any educational program for unemployed youth which is not supplemented by an active job creation program will necessarily fail in the task of easing the social burden of unemployment carried so disproportionately by the young. Programs which provide no realistic job opportunities for the participants amount to little more than cynical political manoeuvres designed to deflect political criticism.

NATIONAL TRANSITION EDUCATION SCHEME (TRANSED)

The brief and to date illfated history of the Transed scheme adds emphasis to the preceeding analysis of EPUY. The 1979-80 Federal Budget allocation for existing youth unemployment programs saw an anticipated net reduction of $27.8 million from the 1978-79 expenditures. The actual net reduction ended up being $55.2 million. This was the context in which the Australian Education Council met in Perth on 25-26 October, 1979. Out of that meeting came a decision to initiate a joint Commonwealth/State school to work transition program. Very few details were forthcoming but the

objective of making unemployment the least acceptable alternative for youth was clearly stated. In an interview with Ross Gittins, Mr Viner argued, in response to the suggestion that the new emphasis on transition education carried side benefits for the Government (reduced unemployment figures and reduced expenditure through reduced dole payments), that that was a "shallow, cynical approach" and that he could assure everyone "that this is a genuine, constructive effort by the Government to do something worthwhile for our young people" (Sydney Morning Herald, 30.10.79).

However, of the projected Commonwealth expenditure of $150 million over five years, only $15.6 million was allocaced for the 1980 school year. Of this only $4.5 million was allocated from the 1979-80 Budget, and it leaves a net reduction in expenditure on youth unemployment programs of approximately $50 million from 1978-79 expenditure levels. The Commonwealth Government has still refused to pay allowances to participants in the TAFE Transed programs, the net effect being a reducation in youth unemployment statistics and a reduction in expenditure. This analysis reinforces the earlier argument that the state's objective is to keep in schools and colleges a greater number of people for longer periods of time; to make schooling more "relevant" to the demands of employers and the labour market; and to disguise the real extent of youth unemployment. And the expenditure on education is simultaneously being reduced.

Further analysis of Transed's development only serves to reinforce these conclusions. In response to the October A.E.C. decision the N.S.W. Government made a submission to the Commonwealth for approximately $26 million in early November, 1979. All proposals were either disallowed or deferred. On November 22 Mr. Viner and Senator Carrick made their joint announcement of the Transed program, but no details or guidelines were announced. N.S.W. was informed, however, that its allowance for 1980 would be $7.8 million and on the basis of this a further submission was made in early December. There was no response to these proposals until February 21, 1980, the date on which the Commonwealth's guidelines were announced. Only $2.5 million out of the total N.S.W. proposal was approved, the major items disallowed being pre-apprenticeship and secretarial studies courses ($800,000 each) to be offered in TAFE. The same proposals were approved for other States on the grounds that no Commonwealth funds would be made available for programs already initiated by the States. N.S.W., and Victoria, are being penalised for initiating their own schemes before the other States. Last, there has been no Commonwealth assurance that the schemes would continue to be funded at the conclusion of the five years.

Because of dissatisfaction over these issues the State Governments have decided not to contribute their share of Transed monies for 1981 ($9 million). Given this history, it is hard to see "a genuine, constructive effort by the Government to do something worthwhile for our young people". Considerable pressure, at the national Youth Conference in September, 1979 and in the media (Harding & Mills, 1979; Sydney Morning Herald, Editorial, 10.10.79; The Financial Review, Editorial, 11.10.79; and Sydney Morning Herald, Editorial, 19.10.79), had been exerted on the Federal Government for a

significant change in its policy towards youth unemployment. Transed was a hurried response to this pressure, so hurried that the Commonwealth's guidelines were not finalised until four months after the initial announcement, and those guidelines are still the subject of dispute between the Federal and State Governments. It has been funded by cuts ammounting to $52.5 million (from 1978-79 to 1980-81) in the Government's only scheme designed to provide actual jobs for unemployed youth, SYETP.

The only possible political objectives of the Federal Government can be to relieve political pressure; to re-institutionalise the unemployed youth and hence artificially reduce unemployment statistics and dole payments; and to increasingly align schooling for those "at risk" to the narrow vocational demands of employers. This does not mean, however, that interventions by those organisations and teachers concerned about the social realities of unemployment and the welfare of students are impossible. The gradual introduction and implementation of programs and courses under Transed will provide opportunities to effect refractions in the Federal Government's objectives. Just as they were possible in EPUY, so too will they be possible in Transed.

CONCLUSIONS

It has been argued, both theoretically and empirically, that the present Federal Government's policies relating to youth unemployment and schooling are consistent with the structural limitations imposed on state policy by a capitalist economy in recession. Attempts are being made to simultaneously reduce the costs involved in the state's essential task of maintaining and reproducing the labour force; make the reproduction process more efficient in terms of more closely aligning schools' products with the emerging demands of the labour market; and to minimise the social problems, and hence legitimation problems, which arise from large scale youth unemployment by keeping the young institutionalised for longer periods of time. The present Government's political and ideological commitment to the "ideals" of free enterprise make it particularly suited to the task.

The limitations inherent in capitalist social relations do not impose, however, a straightjacket on government actions. The state does retain a degree of autonomous freedom to move and a more humane treatment of the young unemployed is possible. Schools and other educational institutions do not have to become the mere play things of the labour market, and job creation schemes are within the realm of possibility. The analyses of EPUY and Transed indicate that refractions of state policy can be effected and indicate the levels and points at which interventions can be made. The purpose and direction of such interventions require much more consideration and can not be taken up in this paper. Beginnings have, however, been made (Freeland, 1980; Frith & Corrigan, 1977; and Whitty, 1980(a) and 1980(b).

REFERENCES

Allwood, L.M. (ed), 1975, Australian Schools: the impact of the Australian Schools Commission, Melbourne, Australian International Press & Publications

Bannister, H. et al, 1979, "Literacy and the schools". In Johnson & Ozolins (eds), Melbourne Working Papers 1979, Melbourne, Sociology Research Group in Cultural and Educational Studies, Department of Education, University of Melbourne

Bowden, P. 1980, "Miners versus the manufacturers: Carnegie's new power thrust", Business Review, September 7-13

Bowles & Gintis, 1976, Schooling in Capitalist America, London, R.K.P.

Campbell, W.J. et al, 1976, Some Consequences of the Radford Scheme for Schools, Teachers and Students in Queensland, AACRDE Report No.7, Canberra, AGPS

D'Cruz & Sheehan (eds), 1978, The Renewal of Australian Schools, Hawthorn, ACER, 2nd. ed.

Encel, S. 1979, "The social significance of the Williams Report", Vestes, Vol.22, No.2

Finn, Grant & Johnson, 1978, "Social democracy, education and the crisis", In Centre for Contemporary Cultural Studies, On Ideology, London, Hutchinson

Fitzgerald, R.T. 1975, Through a real vision mirror: change and education, Hawthorn, ACER

Freeland, J. 1980, "where do they go after school: youth unemployment, legitimation and schooling", Social Alternatives, Vol.1, No.8 (forthcoming)

Freeland & Sharp, R. 1979, "Education, the state and the labour market", paper delivered to SAANZ Conference, Canberra, July

Freeland & Sharp, 1980, "The Williams Report on Education, Training and Employment: the decline and fall of Karmelot", Intervention, No.14 (forthcoming)

Frith, S. 1979, "Education and Industry" Radical Education Dossier, No.8

Frith & Corrigan, P. 1977, "The politics of education", in Young, M. & Whitty, G. (eds), Society, State and Schooling, Ringmer, Falmer Press

Gallagher, M. 1979(a), "The restructuring of the education system in Australia", paper delivered to Labor Resource Centre Conference on Education and the Workforce, La Trobe University, June

Gallagher, 1979(b),"Another attempt to look at the political economy of schooling in Australia", paper delivered to Education and the Crisis Conference, Macquarie University, September

Harding & Mills, 1979, "The attack on the unemployed", The National Times, September 1

Hubbert, G.D. 1980, An Evaluation of the Education Programme for Unemployed Youth, Canberra, AGPS

Jones, E. 1979, "Fraser and the social wage", The Journal of Australian Political Economy, No.5, July

McCann, P.(ed), 1977, Popular Education and Socialisation in the Nineteenth Century, London, Methuen

McLaren, J. 1979, "Encyclopedia of trivia", Vestes, Vol.22, No.2

Simon, B. 1974, The Two Nations and the Education Structure 1780-1870, London, Lawrence & Wishart

Whitty, G. 1980(a), "Society, social justice and social/political education", paper delivered to a conference of the Social Science Education Consortium, University of Surrey, July

Whitty, 1980(b), "A context for critical education", Social Alternatives, Vol.1, No.8 (forthcoming)

Wilson, B. 1979, "The Williams Report: the secondary connection", Radical Education Dossier, No.10

DESIGNING AND IMPLEMENTING A META-ANALYSIS:

THE PROBLEMS INVOLVED

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Given the immense number of studies being researched and/or published it has become extremely difficult to review and synthesize a research area in the conventional manner. Most research studies include an assessment of what is considered as the relevant literature. This process of reviewing the literature requires an identification and collection of material, a commentary on some studies in either a favourable or unfavourable manner, and an attempt to synthesize the material in such a way as to facilitate the drawing of conclusions. The problem facing this inductivist approach (see Musgrave, 1971) is whether the reviewer had selective bias in reporting favourably on some studies, or unfavourably on others and in the decision to omit certain studies (this bias may be tacit). Hence there is a need to more systematically review previous studies and the method of meta-analysis (Glass, 1976, 1978) offers much as an alternative to traditional methods.

Meta-analysis is a quantitative way to reduce the findings of many disparate studies to a common metric (called an effect size), and then to relate this common value to independent variables of a study. For example, in asking whether self-measures are related to achievement we could reduce the measure of association to a simple zero order correlation (see Glass, 1978 p. 374 for details of converting χ^2, Mann Whitney U tests, F tests etc. to simple correlations). Then we could average this value across all studies and/or relate, via anova or correlation, the simple correlation to various design features to answer such questions as -

1. Do well designed studies report larger correlations than poorly designed studies (anova)?
2. Does the relationship between self-measures and achievement differ according to subject matter (anova)?
3. Is the strength of the relationship dependent on sample size (correlation)?

The meta-analysis philosophy has received considerable attention and studies based on this philosophy are beginning to be published. For example, Smith and Glass (1977) considered 375 studies relating to the effects of psychotherapy. These studies produced 833 effect sizes (differences in means between persons who had psychotherapy and control groups divided by an estimate of pooled standard deviation) and represented an evaluation of approximately 50,000 control and experimental persons. On average, the person who received psychotherapy was better off than 75% of those who did not receive treatment. Further, behavioral psychotherapy was found to be no more effective than non-behavioral methods. In another study Glass and Smith (1979) considered nearly 80 studies regarding class size and achievement. These studies yielded over 700 comparisons of achievement in what they termed "smaller" and "larger" classes, and were based on a total sample of nearly 900,000 children of many ages and aptitudes studying a variety of school subjects. Glass and Smith concluded there was a definite inverse relationship between class size and pupil learning. Other meta-analyses have been related to gender effects in decoding nonverbal cues (Hall, 1978); the differential validity of employment tests by race (Hunter, Schmidt, and Hunter, 1979); sex differences in conformity research (Cooper, 1979); the effectiveness of Keller's personalized system of instruction (Kulik, Kulik, and Cohen, 1979);

experimenter effects in behavioral research (Rosenthal and Rosnow, 1975; Rosenthal, 1976; Rosenthal and Rubin, 1978); sex bias in counseling and psychotherapy (Smith, 1980); and many unpublished meta-analyses (Andrews, 1979; Anthappilly, 1980; Carlberg, 1979; El-Nemr, 1979; Hartley, 1979; Hearold, 1979; White, 1979).

Despite the obvious interest in the meta-analysis approach, it has received its share of criticism. Eysenck (1978) has summed up many of the complaints with the use of the computer dictum "Garbage in - garbage out". Eysenck argued that it was not meaningful to pool poorly designed studies, relying on subjective, unvalidated, and unreliable data. Eysenck concluded his criticism by making the usual plea for more research into the methodology of combining studies. Glass and Smith (1978) in a reply, commented that there were "good" studies available and suggested a meta-analysis can help our understanding with regard to the need for improved designs. By conducting a meta-analysis we can see which variables or factors of a design contribute to uncontrolled variance. Further, we can assess the effect of combining good and bad designs and it is no coincidence, given our knowledge of power analysis, that we need "good" designs when the effect we are looking for is small; whereas design does not seem so critical when we are reporting large effects (see Glass and Smith, 1978).

Another suggested problem relates to the implications of meta-analysis. Gallo (1978) gave two illustrations of how a simple average effect can be interpreted quite differently. Taking the Smith and Glass (1977) finding that the average patient was involved in 17 hours of psychotherapy at an approximate cost of $510. Such a patient, given the results of Smith and Glass meta-analysis would exceed the adjustment score of control group clients by .68 standard deviation units. Yet, Gallo questioned whether the patients receive value for their investment of time and money. In one example, Gallo suggested that we take 40 year olds and tell them that after 17 hours at $510 their life expectancy could be raised by .68 standard deviations on untreated persons. This would increase life from an average expectancy of 70 years (s.d. = 10) to 76.8 years. Agreeing with Gallo, we also would not want to be in front of that clinic when it opened its doors for fear of being trampled to death. A second example relates to a car with an average gas mileage of 16 mpg with a standard deviation of 1 mpg. If we purchased a $510 gadget that requires 17 hours to install we could expect a .68 standard deviation increase in mpg. Given an average 15000 miles per year would you install such a gadget when it would take over 22 years to pay back the price of the gadget?

These two examples illustrate the point that the same size effect can be interpreted quite differently and the effect size does not answer the question of effort and expense. We have found, however, that merely reporting the average effect size is not very informative; it is the breaking down into component parts that is of most value.

Light (1979) warned that we should not overlook searching for subject by treatment interaction; a treatment that is best for one person is not necessarily best for all people. Light also warned of the problems of Simpson's paradox (Simpson, 1951) where different conclusions can result when comparing combined totals to individual studies. Yet this is a problem of tallying across contingency tables and not necessarily peculiar to meta-analysis. He suggested that quite often we may be interested in the extreme findings (in the tail of the distribution) and not in the"on the average" effect. Thus the importance of looking for variations in outcomes as signals for further study should not be overlooked. A meta-analysis can highlight these "extremes" and we have followed up such studies in our own meta-

analysis to see what their peculiar attributes are.

Another criticism is that a meta-analysis may not include all the relevant studies. There may be many studies existing in someone's file drawer that could change the conclusion of a meta-analysis. Rosenthal (1979) has attempted to answer this criticism by formulating a statistic that, given the results of a meta-analysis, can determine approximately how many studies need to be in someone's "file drawer" and unavailable to the meta-analysis researcher before a significant result would become non-significant. For example, the mean z effect size from 94 studies of interpersonal self-fulfilling prophecies was 1.014 (Rosenthal, 1969). There would need to be (94/2.706) x (94(1.014) - 2.706) = 3263 studies averaging null results before one would conclude that the overall results were due to sampling bias in the studies summarized by Rosenthal. (The 2.706 is $z = 1.645^2 = \alpha = .05$). This is a confidence inspiring result.

Certainly it would be easy to misuse the meta-analysis method, and for instance it can be imagined how an inadequate survey of the literature could lead to misleading results.

Taking into account the above criticisms, it is our opinion that the meta-analysis provides a method of integrating studies that can aid in the understanding and redirection of research questions. This paper is based on our experience in conducting a meta-analysis. We did encounter a number of problems and felt it would be useful to outline some of these problems so that future users of meta-analysis techniques become more aware of potential difficulties.

Self-measures and performance/achievements

The question addressed in our meta-analysis was the relationship between self-measures and measures of performance/achievement. There were 128 articles yielding 1136 effect sizes (zero-order correlations) based on 68,756 unique persons from 356 unique samples. The study included 15 performance/achievement areas, over 50 different self-measures, 50 performance/achievement tests, persons representing nine countries and seven ethnic groups drawn from various socio economic and grade levels. A total of 15 self-terms were identified, studies were both published (journals) and unpublished (dissertations and conference papers) and sources were selected in various ways and were of varying quality. Briefly, we found an average correlation of .21, no difference in the relationship for males than females, and a moderating influence on results that related either to subject area or nature of tests used.

Problems

Topic Selection

Our decision to become involved in a meta-analysis firstly arose from the desire and motivation to use a procedure that appeared to be intuitively interesting and defensible. We also believed our topic, the relationship between self-measures and achievement, met several necessary criteria for a meta-analysis. The topic selected for analysis met three major criteria, namely uniqueness, suitability and value. Uniqueness referred to the fact that as far as we could ascertain the specific topic had not been the subject of a previous meta-analysis. (Although if a meta-analysis of this topic had been conducted we could have used our study to cross-validate previous studies). Clearly, all topics are not suitable for a meta-analysis, and in particular we could see limited value in selecting a topic where the research findings are consistent and predictable. A topic about which the research indicates a degree of uncertainty or variability across contexts would seem the most suitable

for a meta-analysis. In terms of value, it is our contention that a strong case can be argued for the theoretical and practical value of a meta-analysis focussing on the relationship between self-measures and achievement.

Although we had some knowledge of the selected topic area (gained through the supervision of graduate students), a considerable amount of time was taken up in gaining an appreciation of the competing viewpoints presented in the literature. Clearly advantages do arise when researchers choose a meta-analysis topic consistent with their own expertise.

Literature Search

A computerized literature search was made of three major data bases, Educational Resources Information Centre (ERIC), Comprehensive Dissertation Abstracts, and Psychological Abstracts. The search was restricted firstly by the use of various major descriptors relating to self (self-concept, self-esteem etc.) and to achievement (performance, attainment etc.), and secondly, by the requirement that the retained studies contain data (tables, correlations etc.).

The number and source of studies identified by the search are reported in Table 1.

Table 1

Meta-Analysis Literature Search

Data Base	Years Searched	No. of Studies
ERIC	1961-1979	335
Comprehensive Dissertation Abstracts	1955-1979	251
Psychological Abstracts	1966-1979	116

A number of important facts arise from the data presented in Table 1. The search identified a total of 702 documents, and it was clear that a virtually unfunded study could not cope with reading such a mass of data. This problem was accentuated by the number of additional documents that were identified from references reported in the various studies. Another difficulty arose in that it is one thing to identify studies, it is another to retrieve all the studies. Retrieval of documents can be slow, and at worst unsuccessful, and expensive.

In view of the cost involved, there was a temptation to borrow copies of documents and to read and code articles available in our library without producing a photocopy. Fortunately, in retrospect, we obtained practically all documents used in the study. Consequently, when it came to cleaning the data, and reassessing literature in light of results, the availability of coded articles was an asset.

It is important to point out that the literature search we involved in produced a data base that is fundamentally North American. Although a computerised data base exists in Australia, its infancy and smallness afforded us no previously unidentified articles. Table 2 presents information regarding the country of origin, publication source, number of studies and number of effect sizes used in the meta-analysis.

Table 2

Meta-Analysis Data Sources Indicating Country of Origin,

Publication Source, Number of Studies and

Number of Effect Sizes (in brackets)

Country	Conference	Journal	Microfiche	Monograph	Thesis	Unpublished
Australia	1(4)	2(2)	-	-	4(14)	-
Bolivia	1(1)	1(6)	-	-	-	-
Canada	-	1(8)	-	-	-	-
Great Britain	-	1(6)	-	-	-	-
Kenya	-	-	-	-	1(40)	-
Mexico	1(160)	-	-	-	-	-
Uganda	1(4)	-	-	-	-	-
United States	15(95)	57(361)	19(269)	1(9)	19(148)	-
Philippines	-	1(4)	-	-	-	3(5)

An examination of Table 2 indicates the dependency on North American literature and provides an overview of the literature sample.

Coding Sheet

One of the bases of a good research project is the identification and operationalizing of the worthwhile research question. In this study we felt the question, "what is the relationship between measures of self and measures of achievement?" warranted examination, but were uncertain as to what variables should be coding from the studies. Questions regarding the development of a coding sheet can in part be minimized by modifying procedures used in other studies (see for example Glass and Smith, 1978; White, 1979; Harold, 1979; Hartley, 1979). However, it is certain that each meta-analysis will require specific coding categories that are unique.

We found it necessary to collect 10 articles that were frequently cited in the literature. These articles were read and coded a number of times. This enabled us to develop, check and modify aspects of the coding sheet. We found this procedure to be extremely beneficial.

The range of variables considered in this meta-analysis can be ascertained by examining the coding sheet (Appendix A, this will be distributed at the Conference). Although a considerable amount could be said about the coding sheet, we will restrict our comments to several points.

A number of variables were included on the coding sheet as what might be termed "possibilities". For instance, do the number of pages, number of references, sex of author, type of publication, or year of publication of a study have anything to do with the relationship being examined? The inclusion of such items on a coding sheet enables a meta-analysis to take on a more exploratory, and perhaps interesting, orientation than many other research methodologies.

The volume of literature and nature of topic examined made us acutely aware of the diversity of terminology and range of measuring instruments used in this field. The coding sheet was designed to enable additional self-terms, self-measures and achievement measures to be added as the study advanced. On completion, we had coded fifteen self-terms, fifty eight self-measures and sixty one achievement measures.

The decision to rate the self and achievement measures according to whether they were "home made", "published", or "published and well normed" became quite a problem. Names and dates of tests are not always given, titles are presented in an abbreviated manner, and researchers seem to have a desire to modify existing tests or take a score from some unspecified sub-scale.

The most difficult, and probably subjective, aspect of the analysis was the coding of design quality. In retrospect it would have been more precise to establish specific criteria for each of the quality of design levels - "low", "medium", "high". Smith (1980) did attempt to operationalize quality criteria, but it is clear that problems still remain in this area. A large number of studies did appear to fall into one of the three categories, however it is difficult to make a decision about studies that seem very good except for, say the sex breakdown of the sample is not given, or the sample number is altered without explanation. As three coders were involved in this study it was possible to discuss "difficulties" in papers and reach concensus. The whole question of quality in the design of educational research studies has received a considerable amount of attention recently (Shaver & Norton, 1980) and it seems likely this problem will remain a "front runner" in educational research for some years to come.

In terms of quality of design apparent in the studies, it was surprising to find the majority did not report a measure of internal consistency for either the self or achievement measure, or only reported the value cited in the test manual. In other instances, internal consistency measures were reported, but were misleading. These studies reported normative information that was doubtful because of passage of time, or because the information arose from samples that were completely different (age, sex, socioeconomic status, ethnicity etc.,) from that being used in the particular study.

It is not surprising that by far the majority of studies utilized correlation techniques to examine the relationship between self and achievement measures. However given that many statistical techniques can be reduced to a common metric it was surprising that a number of studies had to be rejected on the basis of inadequate statistical reporting. This tended to apply not only to studies that had only commentary but also to many studies reporting step wise regression, anova and manova.

Sampling the Literature

As the literature search had identified 702 documents, we were faced with a decision regarding the actual number we could read and code. Our initial reaction was to place some restriction on the scope of the meta-analysis. The first step in this restriction was to examine only those studies reporting an association between self-measures and reading achievement. This was a successful limitation, but with 32 studies coded meta- (or megalo) mania set in. A decision was then made to widen the scope of the study by including other measures of performance/achievement (mathematics, grade point average, I.Q. etc.) but, to do this on the basis of a random sample of the literature. The theory of random selection was good; the practice encountered problems. For instance we could not afford the cost or time involved in obtaining dissertations from North America. As the Australian National Library holds microfilm copies of the 1973, 1974 and 1975 doctoral dissertations we had to be content with a selection of dissertations based on convenience. (By various circumstances some dissertations outside these years were included). The second problem mitigating against a random

selection of literature was the fact that a very large number of articles (67) in the random sample presented data in such a manner as to make it impossible to extract the relevant materials required for the meta-analysis. The third difficulty confronting a random selection of literature based on the computer searches was the number of studies not identified in the literature but appearing in the bibliographic entries of the selected studies. As a number of these studies were clearly relevant, and readily accessible they were included in the total sample from which a smaller subset was to be drawn. As more articles came to hand, and the total literature sample expanded, the problem arose of when to stop.

We made the decision to stop after we had coded at least 100 studies, 1000 effect sizes, and 50,000 persons. As the cleaning of data took such a long time we added studies until the two processes, cleaning and coding, converged.

The meta-analysis was finally based on a sample of 128 studies. These studies produced 356 unique samples, a total of 68756 persons and 1136 effect sizes. It was felt that the size of the data base utilized provided the meta-analysis with a considerable degree of generalizability.

Common metric

The nature of the research question details the form of the effect-size. It seemed clear for our study that it was appropriate to reduce the various measures of relationship to simple correlations. There were 94.5 percent of the effect sizes that were originally correlations. The remainder included point biserial correlations, regression related statistics, rank order correlations, t-tests, chi-squares, and Mann Whitney U.

One problem arose in relation to regression studies. It seems that the use of regression was more defensible than simple correlations in many of the studies. Yet partitioning the multiple R^2 into zero-order correlations seemed to lose information. Despite our use of correlation as the common metric we recommend that researchers studying the relationship between self and performance/achievement make more use of multivariate methods, particularly multiple regression.

As Glass (1977) comments it probably matters little whether analysis is carried out in the metric r, r^2 or Fisher's z-transformation of r. Further, jackknifing or weighting the correlations by sample size could also be used. Glass showed the trivial difference between r and r^2 and argued that Fisher's z transformation was developed to solve an inferential problem rather than being a descriptive summary statistic. To indicate the differences, in our studies the average simple correlation between self and performance/achievement using different methods were .21 for the simple r, .21 for r^2, .24 for Zr, .25 using jackknifing, and .26 using weighting by sample size. The median r was .23. These estimates all relate to a measure of central tendency. Yet, in a large study investigating robust estimators of location the mean was found to be one of the worst estimators (Andrews, Bickel, Hampel, Huber, Rogers and Tukey, 1972). Instead of the mean Andrews et. al. (1972) preferred a sine-type estimator they called AMT. The AMT procedure restricts the influence of extreme observations on the value of the estimator and rejects outliers which are too far away from the bulk of the data (see Andrews et. al., 1972, p. 15 for a full description of the AMT procedure). Using the AMT estimates the "average" correlation was .23.

Altogether, we can say that the average relationship between self-measure and performance/achievement is between .21 and .26.

A further problem related to what we should report. We could report how many effect sizes a particular correlation was based on, or the number of persons, or the number of unique samples, or the number of studies. For example, consider a case where there are five effect sizes, then these 5 effect sizes could include 1000 persons whereas 20 effect sizes could be based on a total of only 100 persons. Further, the 5 effects could have come from 1 study or from 5 studies which could lead to different emphases. The 5 effects could also be based on 1 or 5 unique samples. To overcome these problems we recommend that all four sample sizes (effects, persons, unique samples, studies) be reported; although we recommend that effect sizes be the basis for analysis. Our experience with jackknifing revealed that with the large number of effects, conclusions were only trivially altered compared to traditional methods. (Yet this does not mean that others should not investigate the use of jackknifing).

Use of significance tests

One of the benefits of meta-analysis is that data can be compared across studies avoiding many of the problems of inadequate sample sizes and the resultant loss of power. However, when all effect sizes have been collected the problem arises that even trivial differences can be significantly different given the large number of effect sizes. For example in our study a difference of only .06 is needed for two mean effect sizes to be statistically significant at the $\alpha = 0.05$ level. This is a problem common to any study using large samples and merely highlights the often cited adage that significance does not equate to meaningfulness.

Cost and Time

It is possible to conduct a meta-analysis on a very small budget. The actual expenditure in this study is reported in Table 3.

Table 3

Expenditure on Meta-Analysis

Item			Amount
Literature search of data bases			$ 150
Research assistant			$ 824
Cost of -	(i) microfiche	$79	
	(ii) photocopies	$86	$ 165
Total expenditure			$1139

There were other costs that did not involve real money and as might be anticipated the small expenditure in money was more than compensated for by the time put into the study. Over a period of twelve months we estimate the time spent on the project would, if converted to money, amount conservatively to $12,000. It was not just the literature search, obtaining of studies, and the reading and coding that took time. The cleaning of data proved to be slow, and by inference, an expensive activity. Coding had to be double checked, identification codes were occasionally omitted and punching required verification. The large data bank (1136 sets of 3 cards) meant that computer runs were expensive in terms of CPU and paper costs. Moreover, a number of surprising results were identified, thus making it necessary to recheck such figures.

Although it is possible to conduct a meta-analysis with limited financial outlay, it is clear

that researchers should consider the question of funding before embarking on a major meta-analysis.

Publication

Two major questions arise with regard to the publication of meta-analysis data. If just the overall relationship between self-measures and achievement/performance is considered, the first question with respect to publication is what should be reported? Given the large amount of data generated, and the rather extensive nature of our conclusions, there is the problem of deciding how selective we must be before the work is suitable for journal publication.

The second question relating to publication concerns where to publish. The volume of material eventually amassed may be too extensive for a traditional journal article; on the other hand the fragmenting of the findings tends to defeat the purpose of the study - namely what is the overall situation. Whether or not the material is suitable, and warranting book or monograph dissemination is a question we are currently considering. It is interesting that we have a bibliography supplied by Glass (personal communication, 1980), and since supplemented, that identifies 45 meta-analysis studies of which only 26 have been published in recognized journals.

Conclusions

Like any other research methodology, the meta-analysis has its critics and potential problems. In our opinion the advantages outweigh the criticism and possible problems, particularly if the meta-analysis provides clarification of a diverse research area and by implication facilitates the generation of worthwhile hypotheses.

We have attempted to identify some of the problems encountered in our meta-analysis in the hope that our experience may benefit others. Perhaps it is unnecessary to point out that additional and unique problems will arise as each new meta-analysis is completed.

References

Andrews, G.A. A meta-analysis of the treatment of stuttering. Paper presented at the annual meeting of the American Speech and Hearing Association, 1979.

Andrews, D.F., Bickel, P.J., Hampel, F.R., Huber, P.J., Rogers, W.H., & Tukey, J.W. Robust estimates of location: Survey and advances. Princeton University Press, 1972.

Athappilly, K.K. A meta-analysis of the effects of modern mathematics in comparison with traditional mathematics in the American educational system. Ann Arbor, Mi.: University microfilms International, 1980.

Carlberg, C. Meta-analysis of special education treatment techniques. Unpublished doctoral dissertation, Boulder, Col.: University of Colorado, 1979.

Chapman, B. A.A.R.E. Workshop - Secondary analysis research integration. Australian Educational Researcher, 1979, 6, 41-45.

Cooper, H.M. Statistically combining independent studies: A meta-analysis of sex differences in conformity research. Journal of Personality and Social Psychology, 1979, 37, 131-146.

El-Nemr, M.A. Meta-analysis of the outcomes of teaching biology as inquiry. Unpublished doctoral dissertation, Boulder, Col.: University of Colorado, 1979.

Eysenck, H.J. An exercise in mega-silliness. American Psychologist, 1978, 33, 517.

Gallo, P.S. Meta-analysis - A mixed meta-phor? American Psychologist, 1978, 33, 515-517.

Glass, G.V. Primary, secondary, and meta-analysis of research. Educational Researcher, 1976, 5, 3-8.

Glass, G.V. Integrating findings: the meta-analysis of research. In L.S. Shulman (Ed.), Review of Research in Education, Vol. 5. Itasca, Ill.: Peacock, 1978.

Glass, G.V. Personal communication, June, 1980.

Glass, G.V. & Smith, M.L. Reply to Eysenck. American Psychologist, 1978, 33, 515-517.

Glass, G.V., & Smith, M.L. Meta-analysis of research on the relationship of class-size and achievement. Evaluation and policy analysis, 1979, 1, 2-16.

Hall, J.A. Gender effects in decoding nonverbal cues. Psychological Bulletin, 1978, 85, 845-857.

Hartley, S.S. Results of meta-analysis of the effects on mathematics achievement of differential instructional modes. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April, 1979.

Hearold, S.L. Meta analysis of the effects of television on social behavior. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April, 1979.

Hunter, J., Schmidt, F., & Hunter, R. Differential validity of employment tests by race: A comprehensive review and analysis. Psychological Bulletin, 1979, 86, 721-735.

Kuliuk, J.A., Kuliuk, C.L., & Cohen, P.A. A meta-analysis of outcome studies of Keller's personalized system of instruction. American Psychologist, 1979, 34, 307-318.

Light, R.J. Capitalizing on variation: How conflicting research findings can be helpful for policy. Educational Researcher, 1979, 8, 7-11.

Musgrave, A.E. Is science a rational enterprise? Paper presented to the Royal Society of New Zealand, July, 1971.

Rosenthal, R. Experimenter effects in Behavioral Research. New York: Appleton-Century-Crofts, 1966. Rev. ed., New York: Irvington, 1976.

Rosenthal, R. Interpersonal expectations. In Rosenthal and R.L. Rosnow (Eds.). Artifact in behavioral research. New York: Academic Press, 1969.

Rosenthal, R. The file drawer problem and tolerance for all results. Psychological Bulletin, 1979, 86, 638-641.

Rosenthal, R. & Rubin, D.L. Interpersonal expectancy effects: The first 345 studies. The Behavioral and Brain Sciences, 1978, 3, 377-415.

Rosenthal, R., & Rosnow, R.L. The volunteer subject. New York: Wiley - Interscience, 1975.

Simpson, E.H. Interpretation of interaction in contingency tables. Journal of the Royal Statistical Society, Series B, 1951, 13, 238-241.

Shaver, J.P., & Norton, R.S. Randomness and replication in ten years of the American Educational Research Journal. Educational Researcher, 1980, 9, 9-15.

Smith, M.L. Sex bias in counseling and psychotherapy. Psychological Bulletin, 1980, 87, 392-407.

Smith, M.L., & Glass, G.V. Meta-analysis of psychotherapy outcome studies. American Psychologist, 1977, 32, 752-760.

White, K.R. The relationship between socioeconomic status and academic achievement presented at the Annual Meeting of the American Educational Research Association, San Francisco, April, 1979.

EVALUATING THE RELATIONSHIP BETWEEN SELF AND PERFORMANCE/ACHIEVEMENT

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In some areas of educational research the number of studies completed and the contradictory nature of research findings make the traditional review of literature a difficult and perhaps imprecise task. It has been suggested that a more systematic review can be obtained by implementing a meta-analysis (Glass, 1976, 1978). In simple terms, a meta-analysis enables the findings of disparate studies to be reduced to a common or comparable value (the effect size), and this common value can then be related to various independent variables identified in the particular research area.

This paper will endeavour to provide a general overview of a meta-analysis completed regarding the question "what is the relationship between measures of self and measures of performance and achievement?" Given the size of the data base and number of independent variables related to the effect size, this paper will only report a selection of the results. In speaking to the paper a more extensive range of results will be presented.

The Meta-Analysis Focus

Some literature conveys the impression that a moderate and positive association always exists between measures of self-perception and measures of performance and achievement. An initial assessment of the literature suggested this relationship is not clear and precise; in fact, studies exist that virtually support all possible viewpoints. It would seem a number of questions need answering before categorical statements can be made. For instance, not only do we need to know whether a relationship exists between self-measures and performance/achievement, we also require information on the directionality of such a relationship, the magnitude of the relationship, the statistical and practical significance of such relationships, and if these relationships remain similar when various self- and performance/achievement measures are used.

In our opinion, a meta-analysis was needed in the particular area, and mid-way through the study were heartened by Wegner's (1979) critique of Wylie's (1979) second volume in which the use of the meta-analysis technique was strongly supported.

Clearly one of the foundation requirements of a meta-analysis is the literature search. In this study a computerized literature search identified 702 studies purporting to contain data regarding the potential relationship between measures of self and performance/achievement. From this search and additional sources a total of 128 studies were selected to form the data bank for the meta-analysis (see Hansford and Hattie, 1980).

Description of Sample of Studies

Altogether there were 1136 effect sizes (that is, correlations between self-measures and performance/achievement). These effects came from 128 studies and 356 unique samples. The total sample size was based on 202,823 persons but a more representative estimate is that there were 68,756 unique persons. So the "typical study" included 9 effect sizes based on 537 unique persons.

In most of the studies (95%) zero-order product moment correlation coefficients were used. When correlations were not used, every effort was made to transform the statistic used to a correlation. Glass (1978, p.374) has provided a summary table to aid in such conversions. Included among the other statistical procedures used in the sample of studies were t-tests, rank-order correlations, anovas, chi-squares, point-biserials, Mann-Whitney U tests, and regression analysis.

Coding Characteristics

The characteristics of studies and samples selected for coding were subdivided into five areas

(a) Attributes of persons in sample.

(b) Self-terms and types of performance/achievement.

(c) Attributes of self and performance/achievement tests.

(d) Characteristics of samples.

(e) Attributes of articles.

As this paper is limited to a set number of pages, details regarding the variables coded will be distributed during the discussion of the paper.

Results

The overall results of the meta-analysis are presented first. These are followed by a consideration of several variables that tend to modify the overall results. In an endeavour to indicate the nature of the complete study, we have in a few instances juxtaposed our results with a brief comment from the literature. The danger of such an approach is that we can be accused of selection bias with regard to literature.

What is the overall relationship?

The 1136 effects produced for this study had a range of -.77 to .96 with a mean of .212 (standard error = .007), a standard deviation of .231, and a median of .231. The distribution of correlations were slightly negatively skewed (-.60), and had a number of values peaking at or near the central value (kurtosis = 1.27).

There are a number of additional methods for averaging the effect sizes. For instance, the average r to z transformation, Zr is .23, the average weighted r by sample size is .26, and the average r-squared converted to r is .24.

As a number of correlations may be taken from the same study there is a potential problem with interdependencies. Jackknifing (Mosteller & Tukey, 1977) was used to take into account interdependencies between effect sizes. In jackknifing the data are divided into studies and the mean correlation calculated on slightly reduced bodies of data that are obtained by successively leaving out each study. For this study, the jackknifed mean was .245. If the set of data is treated as an ordinary sample of data to which t-distribution methods can be applied (see Glass, 1977; Mosteller & Tukey, 1977), then with a variance of 2.27 we can establish the .95 confidence limits. These limits, -.15 to .64, span zero indicating that on the basis of the jackknifing procedure it was not possible to reject a null hypothesis that the true relationship between measures of self and performance/achievement is zero.

The above estimates are all related to a measure of central tendency, and in a study of robust estimates of location (Andrews, Bickel, Hample, Huber, Rogers & Tukey, 1972) it was reported that the mean was one of the worst estimates. Andrews et al (1972) recommended the use of a procedure called AMT. The AMT restricts the influence of extreme observations on the value of the estimator and rejects outliers which are positioned a long way from the bulk of the data (see Andrews et al., 1972, p.5 for a

complete description of the AMT). Using the AMT an "average" correlation of .23 was found between the variables under consideration.

Considering all the above estimates we can say the average relationship between measures of self and performance/achievement is in the range of .21 to .26. However, it may be more meaningful to say the variance in common is between 4 to 7 percent.

A very effective way of seeing the shape, spread, and distributional characteristics of the correlations is via Tukey's (1977) stem-and-leaf display (Table 1). In Table 1 the value on the left of the vertical line (the stem) is the first digit of the correlation, and the second digit is represented as the leaf on the vertical line. The length of line (leaf) produced is proportional to the number of data values. However, for economy of space we have only recorded every second value in the leaf-lines. The following example illustrates the operation of the stem-and-leaf diagram. A correlation of .21 can be located by referring down the stem to .2, and then along the leaf to .01. There are 12 occurrences of the .21 value in Table 1, however as every second value was omitted we really have 12 x 2 = 24 occurrences. (This represents 24 values of .21 among the 1136 correlations). It can be clearly seen (Table 1) that most correlations centre between -.09 to .35.

Table 1

Stem and Leaf Display of Correlations Between Self-Measures and Performance/Achievement

-.7	7
-.6	3
-.5	75330
-.4	986552
-.3	448763100
-.2	65532110
-.1	1187666544333322221100000
-.0	998777766655554443332222211111100000
.0	000000111222233333334444444555556666666666777778888888999999999
.1	00000000011111111222222222333333333334444444555555555555566666666667777777778888888
.2	000000000001111111111122222222223333333444444444445555555555566666666666666777777778888888888889999999999
.3	0000000000000000011111111122222222233333333333344444444444555555566666666777777888888889999999999
.4	000000111111111122222223333344445555556666667777888889999
.5	00000111122222222333344455566677788 9
.6	01222233477899
.7	018
.8	67
.9	06

Given the immensity and diversity of literature it is probably possible to find some support for virtually any viewpoint regarding the relationship between "self" and "performance". A number of studies do support the generalized view of Purkey (1970) that "the overwhelming body of contemporary research points insistently to the relationship between self-esteem and academic achievement (p.iv)". Others are more supportive of the Mintz and Muller (1977) view that "the most startling result of this study is the universally low correlations between self-concept and achievement" (p.56). Burns (1979) while supporting the existence of a positive relationship between "self" and "performance" raises what he considers a cautionary note when he points out "16 percent of the variance in academic performance can be 'explained' in terms of self-concept level" (p.280). Rubin, Dorle and Sandidge (1976) sound an even louder warning when they point out that the addition of self-esteem to multiple regression equations derived from SES and IQ accounted for no more than an additional 3% of the total variance explained in a prediction of school achievement. "While these increases were statistically significant, their practical significance is negligible" (Rubin et al., 1976, p.18).

Does gender modify the relationship?

Table 2 presents the effect sizes broken down according to the sex of persons in the sample.

Table 2

Summary Statistics Broken Down by Sex of Person

Sex	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Male	288	42831	104	40	.26	.23
Female	268	35167	91	39	.24	.22
Both	576	124533	159	98	.17	.21

Note: Not Given = 4

F 2,1129 = 16.71 p< .000

As can be observed (Table 2) the F-statistic is significant, but this is not surprising given the large number of degrees of freedom involved. (In all tables the F is based on the number of effects). An examination of Table 2 reveals a difference of .02 between the mean correlations for males (.26) and females (.24), and in our opinion this does not reflect a meaningful difference. In other words, based on our data the relationship between measure of self and performance/achievement is similar for males and females.

A range of opinions occur in the literature regarding the possibility of a sex difference in the "self" and "performance" question. Burns (1979) suggests that there "appears to be a sex difference in the self-concept - achievement relationship" (p.283). Chadwick, Bahr and Stauss (1977) on the basis of a North American Indian sample reported "that self-esteem is much closely linked on GPA for males than females (p.161). Primavera, Simon and Primavera (1974) suggested the relationship between self-concept and academic achievement holds for girls, but not necessarily for boys. Simon and Simon (1975) felt the Primavera et al. (1974) results reflected the type of achievement measure used, and the restriction of their sample to Catholic schools. Purkey's (1970) conclusion stated the "relationship appears quite clear for boys, but less so for girls" (p.15). Rubin (1978) in a study with nine, twelve, and fifteen year olds reported that "self-esteem ratings at earlier ages are more clearly related to academic achievement for girls than boys" (p.433).

Does grade-level modify the relationship?

The breakdown of effect sizes in relation to the grade-level of persons is presented in Table 3.

Table 3

Summary Statistics Broken Down by Grade

Grade	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Pre-School	40	979	7	5	.12	.34
Primary	717	108911	243	65	.20	.22
Secondary	309	79204	72	44	.27	.23
College/University	60	12567	31	20	.14	.22

Note: Not Given = 10

$F\ 3,1122 = 10.96$, $p < .000$

It is indicated (Table 3) that during the formal school period (pre-school to secondary) there is an increase in the relationship (.12 to .27). However, this relationship then shows a decrease at the college/university level (.14) which may be a function of the fact that college and university students represent a very selected group of the population.

O'Malley and Backman's (1976) longitudinal study reported that self-esteem was "linked with educational attainment, however, the linkage is complex and shows evidence of change over time" (p.31). Piers and Harris (1964) suggest the relationship between self-concept and achievement is "considerably greater at the sixth-grade level" (p.73). However, Williams (1973) reports "the correlation was greatest in fourth grade (r=30) decreasing at progressively higher grade levels" (p.378). Rubin (1978) with a sample of nine to fifteen year olds reported that the "relationships between self-esteem ratings and achievement tend to increase in strength over this period of time" (p.433).

Does the self-term used modify the relationship?

During the meta-analysis fifteen apparently different self-terms were identified in the studies. The summary statistics relating to these terms are presented in Table 4.

An examination of Table 4 indicates considerable variation in the relationship between the various self-terms and performance/achievement. There is a very small difference in the value of the association when the terms self-concept (.18) and self-esteem (.22) are used. However a substantial difference is evident when these two major terms are compared with the more specific term self-concept of ability (.42). With the three major terms excluded (self-concept, self-esteem, self-concept of ability), there is considerable variation (-.05 to .53) among the other twelve terms. The interpretation of Table 4 is made difficult by the small number of effects, studies, and unique samples associated with some terms, and by the problem of validly equating some of the self-terms used with the more traditional notions of self-concept or self-esteem.

Does the type of performance/achievement test used modify the relationship?

There were fifteen different types of performance/achievement coded during the analysis. Table 5 presents the statistical information concerning these types of performance/achievement.

Table 4

Summary Statistics Broken Down by Self-Term

Term	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Self-concept	728	88796	215	71	.18	.22
Self-esteem	187	39153	74	31	.22	.17
Self-concept of ability	130	48352	44	20	.42	.22
Self-acceptance	18	3929	67	4	.14	.31
Self-perception	15	2919	10	1	.26	.09
Ideal-self	14	3639	4	2	-.05	.10
Self-assurance	8	1244	2	1	-.14	.11
Self-sentiment	8	1244	2	1	.14	.06
Self-attitude	7	1154	2	2	.27	.08
Self-confidence	7	9334	4	4	.16	.07
Self-regard	4	914	2	1	.23	.04
Self-actualization	4	164	4	2	.05	.37
Identity development	3	877	2	1	.12	.05
Self-expectation	2	317	2	1	.53	.20
Self	1	787	1	1	.24	.00

F 14,1121 = 13.54, p< .000

Table 5

Summary Statistics Broken Down by Performance/Achievement

Type	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Reading	210	31786	120	47	.18	.27
Vocabulary	47	9724	27	11	.24	.15
Verbal	14	3669	[illegible]	8	.02	.35
Language	54	6174	33	10	.25	.18
English Comprehension	21	8505	22	11	.26	.21
Spelling	24	4319	17	9	.09	.23
Mathematics	194	30317	111	35	.20	.21
Science	20	6898	16	13	.24	.24
Social Studies	32	6429	21	7	.28	.20
Work Study	2	774	1	1	.39	.12
Perceptual	30	1617	30	1	.11	.20
Achievement Motivation	7	1140	3	2	.23	.12
Composite	141	39876	59	40	.21	.19
I.Q.	155	20052	66	31	.18	.23
Grade Point Average	185	31543	55	35	.34	.23

F 14,1121 = 3.781, p< .000

When self-measures were related to the type of performance achievement test, there was a range in the relationship from .02 for verbal to .39 [illegible] work study. There seemed to be a similarity between the first five types of performance/achievement (reading, vocabulary, verbal, language, English comprehension), that related in a general way to verbal facility or ability. However, an examination of the studies containing these types of performance, achievement suggested the authors did differentiate between these abilities. Statistically, no significant differences (F 4,141 = 3.74, p< .01) existed between these 5 types of performance/achievement.

Does the name of the self-test used modify the relationship?

A total of fifty-eight tests relating to self-perception were identified during the analysis. Clearly, a diversity of tests exist, many of which were specifically constructed for a study, had no reported, or low reliability, and often few items. Table 6 presents the summary statistics relating to the nine tests for which there were more than twenty-five effect sizes.

Table 6

Summary Statistics for Self-Tests Broken Down by Name of Test

Name	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Coopersmith	159	88796	215	24	.22	.18
Bills	146	11830	21	4	.19	.17
Piers-Harris	132	11610	74	15	.23	.23
Brookover	130	47292	39	18	.43	.22
Brown Referents Test	72	3831	72	1	.11	.20
Sears	72	6399	13	5	.07	.20
Tennessee	32	2310	13	8	.06	.23
Self Descriptive Inventory	32	2368	1	1	.16	.14
Wattenberg and Clifford	28	250	2	1	.05	.38

F 8,682 = 10.52, p< .001

The first three tests, Coopersmith (.22), Bills (.19), and Piers-Harris (.23) have effect sizes close to the overall average (.21), which is not surprising given their considerable contribution to the total data base. It should be noted that the Brookover test, with its specific relationship to academic ability produced a very high and significant relationship (.43). As can be observed (Table 6) the other tests had relatively low (.06 to .16) relationships with performance/achievement.

Does the name of the performance/achievement test used modify the relationship?

Although a total of sixty-one performance/achievement tests were coded during the analysis only twelve contained more than twenty-five effect sizes (Table 7).

Table 7

Summary Statistics for Performance/Achievement Tests Broken Down by Name of Test

Name	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Grade Point Average	185	46482	70	43	.27	.24
Iowa Test of Basic Skills	119	9245	21	11	.30	.15
California Test of Mental Ability	83	10778	29	8	.20	.17
Stanford Achievement Test (Reading)	81	9118	22	13	.16	.29
Teacher Rating	62	19343	26	10	.34	.20
Cooperative Primary Tests	60	3213	60	1	.16	.20
California Achievement Test	57	4586	18	10	.21	.17
Stanford Achievement Test (Math)	55	7484	26	8	.17	.21
Comprehensive Test of Basic Skills	48	4460	8	5	.14	.13
Raven's Progressive Matrices	30	1617	30	1	.11	.20
Detroit Intelligence Test	29	350	7	2	.06	.38
Metropolitan Achievement Test	25	2767	16	8	.17	.19

F 11,817 = 8.16, p< .000

A considerable range (.06 to .34) in mean correlation is evidenced in Table 7. Teacher rating (.34) and grade point average (.27), had rather high mean correlations.

Does restricting the range of variables modify the relationship?

It is well known that restricting the range of variables will, in general, lower the correlation between variables. Table 8 and 9 present the summary statistics relating to the effect of restricting the range of self-measures and measures of performance/achievement.

Table 8

Summary Statistics for Self-Tests Broken Down by Range of Restriction

Range	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Substantial	24	894	6	6	-.06	.40
Restriction	22	4207	10	7	.23	.12
None	1078	196342	336	112	.21	.22

Note: Undetermined = 12

F 2,1121 = 16.91, p< .00

Table 9

Summary Statistics for Achievement Tests Broken Down by Range of Restriction

Range	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Substantial	31	2724	12	12	.15	.32
Restriction	96	13876	31	13	.10	.28
None	902	175109	224	98	.23	.22

Note: Undetermined = 107

F 2,1026 = 14.87, p< .000

In both cases (Tables 8 and 9), restricting the range of variables produced a lower correlation. Interestingly enough, most studies did not select extreme groups or groups with small variability. Where restriction was imposed, it tended to be applied to only one of the variables under consideration. These tables (8 and 9) highlight the danger of researchers making broad generalizations when they choose samples that are homogeneous with regard to the variables under investigation.

Does where the study is published modify the relationship?

There were differences in the "self" and "performance" relationship that reflected where the study was published (Table 10).

Table 10

Summary Statistics Broken Down by Where the Article was Published

Published	No. of effects	No. of persons	No. of unique samples	No. of studies	Mean	SD
Journal	387	68806	189	63	.22	.21
Microfiche	269	51419	46	19	.23	.25
Conference	264	47242	59	18	.27	.19
Thesis	202	30428	50	24	.11	.21
Monograph	9	129	9	1	-.09	.65
Unpublished	5	4799	3	3	.19	.11

F 5,1130 = 16.23, p< 0.000

Based on the evidence derived from a reasonable number of studies and effect sizes (Table 10) it would seem that theses report lower effect sizes (.11) than journal articles, (.22) microfiche reports (.23) and conference papers (.27).

Conclusions and Discussion

The purpose of this meta-analysis was to explore the apparent relationship that exists between how person's perceive themselves (self-concept, self-esteem etc.) and their ability as assessed by the various performance/ achievement measures.

A total of 1136 effect sizes were examined in this study, and it was concluded that the mean correlation between measures of self and performance/achievement was .21, with a range of association varying from -.77 to .96. Using various estimates of the average relationship or central tendency it was possible to establish a range in the mean relationship of .21 to .26. Having established the existence of a low and positive correlation it is probably more meaningful to translate the reported association in

terms of variance. Depending on the estimate used, 4 to 7 percent of the variance between self-measures and performance/achievement can be explained. Both in terms of mean correlation or variance the level of association may seem very small, however, it is our contention that "self" may be as strongly linked with performance/achievement as any other personological variable. In other words if parents or educational authorities and institutions believe achievement levels are important, an investment of time or money in the improvement of self-concept or self-esteem may have as good results and as a similar investment in say concern with sex differences, socio-economic status or ethnicity.

Having concluded a low and positive relationship exists between measures of self and performance/achievement. It is necessary to express some concern and perhaps a warning regarding the use of "the average" or "typical" relationship approach. It may not be surprising that we found a number of variables can modify the "average" relationship between "self" and performance/achievement. For instance, such variables as grade level, socio-economic status, self-test and self-term used, reporting of reliability coefficients, nature and type of achievement measure, method of sample selection, quality of design, and restricting the potential range of variables may have a marked influence on the outcome of a study.

An important question raised with regard to meta-analysis such as this one is whether or not they provide "the" definitive answer. Certainly we agree with Wegner (1979) that a meta-analysis was needed in this area and that our study will help clarify this research area. In our opinion, this study provides the most definitive summation of the relationship between measures of self and performance/achievement reported so far. A meta-analysis, such as this one, does not spell "the end" of a research controversy; in fact, it may be "the beginning", as we hope our findings provide the basis for generation of worthwhile hypotheses.

References

Andrews, D.F., Bickel, P.J., Hampel, F.R., Huber, P.J., Rogers, W.H., and Tukey, J.W. Robust estimates of location: Survey and advances. Princetown University Press, 1972.

Burns, R.B. The self concept in theory, measurement, development and behaviour. New York: Longmans Inc., 1979.

Chadwick, B.A. Bahr, H.M., and Stauss, J. Indian education in the city: Correlates of academic performance. Journal of Educational Research, 1977, 70, 135-141.

Glass, G.V. Primary, secondary, and meta-analysis of research. Educational Researcher, 1976, 5, 3-8.

Glass, G.V. Integrating findings: The meta-analysis of research. In L.S. Shulman (Ed.), Review of Research in Education, Vol. 5 Itasca, Ill.: Peacock, 1978.

Hansford, B.C. and Hattie, J.A. Designing and implementing a meta-analysis: The problems involved. Paper presented at the annual meeting of the Australian Association for Research in Education, Sydney, 1980.

Mintz, K., and Muller, D. Academic achievement as a function of specific and global measures of self-concept. Journal of Psychology, 1977, 97, 53-57.

Mosteller, F., and Tukey, J.W. Data analysis and regression: A second course in statistics. Reading: Addison-Wesley, 1977.

O'Malley, P.M., and Blackman, J.G. Self-esteem and educational attainment: A longitudinal analysis. Paper presented at the annual meeting of the American Educational Association, San Francisco, 1976.

Primavera, L.H., Simon, W.E. and Primavera, A.M. The relationship between self-esteem and academic achievement: An investigation of sex differences. Psychology in the Schools. 1974, 7, 213-216.

Purkey, W.W. Self concept and school achievement. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Rubin, R. Stability of self-esteem ratings and their relation to academic achievement: A longitudinal study. Psychology in the Schools. 1978, 15, 430-433.

Rubin, R., Dorle, J. and Sandidge, S. The Coopersmith self-esteem inventory related to academic achievement and school behavior. (Interim Research Report No. 23). Minneapolis, Minnesota.: University of Minnesota, 1976. (U.S. Department of Health, Education, and Welfare, National Institute of Education).

Simon, W.E., and Simon, M.G. Self-esteem, intelligence and standardized academic achievement. Psychology in the Schools, 1975, 12, 97-100.

Tukey, J.W. Exploratory data analysis. Reading, Mass.: Addison-Wesley, 1977.

Williams, J.H. The relationship of self-concept and reading achievement in first grade children. Journal of Educational Research, 1973, 66, 378-389.

Wylie, R. The self-concept: Theory and research on selected topics. (Vol. 2). Lincoln: University of Nebraska Press, 1979.

FROM THE SCHOOL LEAVERS POINT OF VIEW

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1. Introduction

People who have recently left school are able to reflect on their past experience and are in the process of making meaning of a new life style. They have ideas about what they would like to do and their chances of succeeding, they have family and friends and experiences which they could reasonably expect to be resources and they have beliefs about the world of work. By asking questions about many of these things it seemed possible that some evidence of changes in meaning could be found in the first year of transition.

A study initiated in Newcastle during 1979 set out to place such questions, set the answers in the context of the relevance of school experiences on entering the workforce and to attempt to map some of the changes in the nature of work force membership which occurred in the immediate post school period. The present paper presents some preliminary results which help to establish the school leavers' perpective, at the point of departure from the school community, on such matters as reasons for leaving school and hopes for the future, the resources provided for them with particular emphasis on the schools' contribution, the process of job search and the school leavers feelings and beliefs about work.

2. Population and Method

In the Newcastle area a sample of all school leavers from the 1978 school year was drawn randomly within sexes from eleven secondary schools and structured interviews were used on two occasions a year apart (March-April 1979-80) with an additional brief contact made at approximately 5 months after the first interview. Answers were categorised according to the main indicators provided by the interviewees. The present report gives evidence only from the first interview which for most people was 4 to 5 months after leaving school though for some it was up to 13 months.

TABLE 1

YEAR FOR LEAVING SCHOOL AND CREDENTIALS

Left School	Rough Magnitudes Australian circa 1978*		Newcastle 1979 Sample		Credentials on Leaving			
Year 7-9	25,000	10%	10	5.4%	No Sch Cert	10		
10	90,000	36%	87	47.0	No Sch Cert	10	Total No Sch Cert	10.8%
					Sch Cert	77		
11	45,000	18%	14	7.6%	Sch Cert	14		
12	90,000	36%	74	40.0%	Sch Cert	3	Total Sch Cert	50.8%
					HSC	71	HSC	38.4%
	250,000		185			185		

Source: * P. Karmel (1980), p.38.

3. Reasons for Leaving School and Hopes for the Future

3.1 Reasons for Leaving

The majority of interviewees left school principally because they had obtained the credential which was their goal. This reason was the response given most readily, particularly by those students leaving school at the end of year 12 and year 10. All of the former and 75.3% of the latter gave this as

a principal reason for leaving; indeed it was the sole reason given for leaving school by 57.6% of respondents. Other reasons for leaving did not necessarily imply a lack of credentials except for years 7-9.

TABLE 2

PRINCIPAL REASON FOR LEAVING SCHOOL

	H.S.C.	S.C.	Wanted a Job	Had enough school	Had a Job	Not Coping	Other	Total
Years 7-9	0	0	1	3	2	1	3	10
10	0	58	6	4	9	6	4	87
11	0	0	1	1	6	5	1	14
12	71	0	0	2	0	0	1	74
	71	58	8	10	17	12	9	185

3.2 Hopes for the Future

When leavers were encouraged to express their hopes for "what they would really like to be" if they had a free choice, it became clear that some had left school before achieving the usual prerequisite for direct entry to that occupation, while others may have been "overqualified".

TABLE 3

PREFERRED OCCUPATION

Credentials	Professional/ Managerial	Clerical/ Sales	Skilled & Semi-skilled Trades	Unskilled/ Other
No Sch. Cert.	9	4	4	9
School Certificate	15	25	43	11
H.S.C.	50	7	7	7
	68(36.8%)	36(19.5%)	54(29.2%)	27(14.6%)

Differences between the sexes were apparent (x^2=45.605 df=3 $<$.001) since boys preferred trades and girls preferred clerical work.

The main reasons given for choosing the job they expected to "have in the long run", which was occasionally (N=13) a more modest ambition, was interest in the work (72.5%). This was not foremost for 16.8%, whose choice was principally directed towards work they were likely to be able to get, and for 10.8% who indicated money or security as the principal determinant of choice. However, this latter factor was mentioned by only 16.8% of all those responding to this question, while a realistic assessment of the work they were likely to get was mentioned by 28.7%. Interest, mentioned by a total of 76.6%, was clearly the most significant determinant of choice. Nevertheless, while 35.1% considered it worth waiting for a job that suited them, 60.5% felt that it was better to take any job rather than being unemployed. This opinion was held irrespective of current job status.

TABLE 4

JOB STATUS

Year Left	In Job	Students	Unemployed
Year 7-9	4	0	6
10	48	22	17
11	12	1	1
12	27	33	14

Job status at the time of interview was related to the year of leaving school in that a disproportionate number of Year 11 leavers were employed, the majority of students (58.9%) were from Year 12, and a disproportionate number of year 7-9 (60%) were unemployed.[1] At the time of the first interview 21% of those working were in their preferred job, but it is interesting that those already employed but not already in their preferred job were less hopeful than others (x^2=9.760 df=4 <.05) about being able to do what they preferred and the main reasons given were lack of appropriate school background (32.8%) and the current job situation (47.5%). People doubtful of being able to have the job they would really have liked had their choices distributed through a variety of occupations though mainly in trades (27.9%) where this difficulty came from the job situation and the professions (42.6%) where the difficulty was their past schooling. On the whole then school leavers were reasonably optimistic, but this was tempered by realism, and they were initially motivated by interest in the job, rather than money and security although these were still considered important.

4. What effective resources did the school leavers feel they had?

4.1 The School

The school was seen as an important resource, and for most school leavers the reason it was important was that it could help to get jobs, though for those leavers who became students general education and personal development rated as highly. (x^2=28.849 df=8 <.001)

TABLE 5

SCHOOL LEAVERS VIEW OF THE IMPORTANCE OF SCHOOLS

Reasons school is important		Current Job Status		
		Unemployed	Students	In Jobs
To help get a job	(37.3%)	15	13	41
For general education	(27.6%)	9	18	24
For personal development	(11.9%)	1	16	5
Some years only were useful	(10.8%)	5	6	9
School was no use	(11.4%)	8	3	10
Not classifiable				(2)

Most school leavers also believed that their parents thought school important. To an even greater extent this was seen to be related to future job prospects (60.5%) though some saw general education (28.6%) and personal development (6.5%) as important to their parents. Approximately half (50.3%) felt they agreed with their parents on the nature of the school's importance and 30.8% agreed on its importance being as preparation of some kind for future work.

4.1.1 Careers Education in Schools

Given this expectation, schools attempt to meet the needs of parents and pupils by offering a variety of career and personal development courses and by organising work experience. These offerings and their reception by pupils will be described before their implications for job status are considered.

Careers and personal development lessons were available to some extent in every school yet only 62.7% of pupils reported having careers lessons and 76.8% reported personal development lessons. The careers lessons were seen as useful for gaining information (63.8%) and for learning techniques in job-

1 Sturman (1979, p.50) comments that CES figures for 1975 may imply that "rates of unemployment for very early leavers could be twice that for all teenagers". In this study with a small number of people leaving before year 10 the rate is 3 times as great as for all teenagers.

seeking (56.9%). Personal development courses were found generally useful by 53.5% and in a limited way by a further 16.9%. Some personal development courses apparently had a limited focus, e.g. sexual relationships.

Work experience was organised to some extent by all but one school and 90.7% of pupils having this experience were able to try a job which was interesting to them. The experience was seen by pupils as helping them decide about a job (77.3%), understand more about conditions of work (83.5%) and understand themselves better (70.1%). In addition 39.2% of pupils said that work experience influenced their feeling about school. Of these 28.9% indicated being influenced to stay and 50.0% to leave. Students clearly felt that work experience was valuable though only 11.3% were given any introduction to it by the school and only 23.7% had any follow up.

The school also contributed by being widely recognised as a source of information about jobs.

TABLE 6

SCHOOL LEAVERS ACKNOWLEDGING SOURCES OF INFORMATION ABOUT JOBS
(up to 3 sources recorded)

Careers advisor, counsellor or other staff	87	Vocational Guidance Bureau	65
School contact	18	Careers Reference Centre	29
Work experience	23	Family or friend	55
No information	43	Own initiation	37

Similarly the school was the major provider of information to all members of the sample on how to go for an interview 41.1% (with parents 9.2%, others 9.2% and multiple sources 12.4%) and on how to apply for a job 50.3% (parents 8.6%, others 4.9%, and multiple 15.7%).

Thus the school was seen as making a direct and comparatively substantial contribution to career education, but other factors should be mentioned. On information about jobs 23.2% of leavers said they had no information and 46.5% said they had very little. In addition 28.1% had no information on how to go for an interview and 20.5% were not told how to apply for a job. Clearly further education in this area would have been desirable.

The timing of school careers programmes at present needs some review since pupils leaving school before Year 10 were less likely to benefit except through personal development courses.

TABLE 7

PERCENTAGES OF STUDENTS HAVING CAREERS EDUCATION

	(Number)	Work Experience	Any Information about Jobs	How to be Interviewed	How to complete an Application	Careers Lessons	PD Courses
Year 7-9	(10)	0.0	30.0	50.0	30.0	30.0	100.0
10	(87)	59.8	72.4	77.0	89.7	78.2	77.0
11	(14)	64.3	78.6	71.4	85.7	64.3	64.3
12	(74)	44.6	86.5	68.9	73.0	48.6	75.7

4.1.2. School Values and their Effects

The way in which most schools are structured, so that those pupils who remain longer and have higher academic attainments have most status, can influence the careers of all pupils. Though not an integral part of career education it was interesting to note the percentage of pupils who had responsibilities in school activities (e.g. prefect, sports captain). This was only 22.7% of the total number and

once again it was the early leavers who were penalised. In addition, analysis in terms of job status indicated that the major number of leadership activities were undertaken by future tertiary students.

TABLE 8

PERCENTAGE DISTRIBUTION OF SCHOOL RESPONSIBILITIES (N=42)

(a) By Year of Leaving		(b) By Job Status	
Year 7-9	0.0	Unemployed	9.5
10	19.0	Employed	42.9
11	9.5	Students	47.6
12	71.4		

The schools values may also influence pupils expectation of success or failure. When school leavers were asked whether anything in their lives had given them the idea that they were likely to fail and/or likely to succeed the greatest single source of such feelings acknowledged in this first interview came from their school experience.

TABLE 9

FEELING OF FAILURE OR SUCCESS

	% of sample	Source of Feeling			
		School	Home or Peers	Own Idea	Job experience or other
Feel they may fail	35.1%	17.8%	7.6%	6.5%	3.2%
Feel they may succeed	61.6%	21.6%	11.9%	17.8%	10.3%

Perhaps not suprisingly those who stayed at school longest were those who had felt more likely to succeed while those leaving earlier were more likely to have felt failure.

TABLE 10

YEAR OF LEAVING AND FEELINGS OF FAILURE OR SUCCESS

	Feel likely to Fail			Feel likely to Succeed		
	Total	School Experience	Other Source	Total	School Experience	Other Source
Year 7-9	80.0%	50.0%	30.0%	50.0%	10.0%	40.0%
10	29.9%	11.5%	18.4%	51.7%	13.8%	37.9%
11	21.4%	7.1%	14.3%	71.4%	28.6%	42.9%
12	37.8%	23.0%	14.9%	73.0%	31.1%	41.9%

4.1.3 The Influence of School Experience on Future Careers

The clearest influence of the school was through the academic credentials attained, yet the connection was perhaps not as direct as might be anticipated. In particular at this first interview a distinction could be made between those with a higher level H.S.C. (co-ordinated mark of 260 or more) and those with a lower level pass (below 260).

TABLE 11

SCHOOL CREDENTIALS AND JOB STATUS

	Higher H.S.C.	Lower H.S.C.	S.C.	No S.C.
Unemployed	0	14	16	8
Students	22	10	23	1
In Jobs	15	10	55	11

$x^2 = 47.455$ df=6 $< .001$

The similar percentages of unemployed from the school certificate and the higher school certificate (17.0% and 19.7%) cast doubts on any assumption that further school education necessarily leads to greater job opportunities. Whether these percentages remain similar over a long period is yet to be analysed.

Beyond this, only two aspects of careers education were significantly related to current job status. The first was information about jobs (x^2=11.753 df=4 $<$.02) in which a higher proportion of the unemployed had no information; the second was information about how to go for an interview (x^2=14.894 df=6 $<$.025)) in which more of the permanently employed had help from outside the school or from multiple sources. From the values of the school came two other possible influences on job status. One was number of responsibilities at school (x^2=7.824 df=3 $<$.05) where full-time students and employed people had undertaken a higher proportion of school activities, but this effect was largely compounded with year of leaving.

Finally and probably related to feelings of success or failure were the numbers of school leavers going on to further study. These percentages confirm that those who go further in study in school are likely to continue to do so after school. Year 7-9 - 0.0%; Year 10 - 55.2%; Year 11 - 57.1%; Year 12 - 83.8%.

TABLE 12

SCHOOL LEAVERS CONTINUING STUDY

	Full Time Students				Part-time students: Employed				Part-time students: Unemployed				
	HSC	Yr 11+	SC	No SC	HSC	Yr 11+	SC	No SC	HSC	Yr 11+	SC	No SC	Total
Uni or CAE	25	0	0	0	5	0	0	0	1	0	0	0	31
TAFE	7	2	21	0	17	5	21	2	5	0	3	0	83
Other	0	0	0	1	0	3	0	0	0	0	0	0	4
	32	2	21	1	22	8	21	2	5	0	3	0	118

While higher level H.S.C. leavers tended to go to University or C.A.E., lower H.S.C. and other leavers went to the Tech. College, which in Newcastle includes people employed as nurses. TAFE clearly undertakes the major role in further education yet schools tend to be oriented towards universities and CAEs. If further study enhances future job prospects the schools' values may have long term effects on job status.

As resources careers education, personal development programmes and work experience were available in most schools and were well received on the whole. The fact that they did not directly contribute to current job status does not demonstrate their futility. The improvement of such courses and the extension of their availability before year 10 is desirable if they are to become part of an essential core of experience for all pupils. The aims of the school are undoubtedly wider than preparation for employment yet getting a job is one of the chief meanings which school has for many people. In relation to this meaning the schools' most direct contribution to a pupil gaining employment seemed to be through academic credentials and through information about jobs. Further, it appeared that schools continue to value most highly an academic elite to whom are given both responsibilities and feelings of success. There is a need to observe the longer term effects of these value structures and to investigate the results achieved by schools who have experimented with different value structures.

4.2 Family and Friends

Family and friends were the other major resource recognised and were mentioned immediately by 61.6% of leavers as important when looking for a job.[1] Up to five resources used in looking for a job were recorded, and in all, 164 respondents mentioned family or relative and family friends. Other resources at this time were C.E.S. (79), positions vacant advertisements (126) and simply going to ask (97). The experience of that half of the sample who were in full-time employment indicated that the traditional job search procedures of scanning advertisements remains relevant. Over a third (35.2%) of the current full-time jobs were obtained as a result of answering an advertisement. Taking the initiative and calling on prospective employers without knowing of specific vacancies, produced results for a further 19.8%. However, in a tight labour market, two other methods of finding jobs were proving important. Almost a quarter of those with full-time jobs (24.2%) had obtained them through personal and family contacts which worked in such a way that the position vacant could not be regarded as having been obtained in open competition. A further 13.2% regarded the grapevine which alerted them to the possibility of a vacancy or job opening as responsible for them gaining the job. This is in contrast to the findings of Tierney et al in 1974 and Dufty in 1973, in neither of which parents and friends were influential in obtaining jobs (in Sturman, 1979, p.74). This experience of the intervention of personal contact and influence in obtaining the current jobs of 37.4% of those in full time employment, can be extended by the experience of other school leavers and including part time jobs held while at school and vacation employment. Forty-two percent of all jobs which respondents reported having obtained involved these factors.

It is interesting that approximately similar percentage of 42.2% of all respondents and 42.9% of those in full time jobs agreed with the statement that "whether you get a job or not depends on who you know". Placement by official employment agencies such as C.E.S. accounted for only 5.5% (N=5) of current full-time positions. Of those registered with C.E.S. (N=85) for a job, 49.4% found them personally helpful but only 11.8% helpful in suggesting jobs.

Family and friends not only helped in obtaining jobs but were sources of information about occupations, about how to go for interviews and to make applications but in these they rated lower than the school. It seems probably also that with 91.9% of the school leavers continuing to live at home the family would exert influence on other relevant values. There was for example, a good deal of agreement between the leavers idea of what it meant to be "grown up" and what they thought their family meant by it except that whereas the younger people were more inclined to see making their own decisions as a factor, some (18.4%) felt either that they had no idea what their parents would mean by being grown up or that their parents would never be able to realise that they were grown up.

TABLE 13 WHAT IS MEAN BY "BEING GROWN UP" (PRIMARY RESPONSE)

	Behaving appropriately	Making own decisions	Financial independence	Taking responsibility	No idea/wont realise I am
Leavers	40.5%	22.2%	16.2%	18.9%	2.2%
Parents	40.0%	14.1%	10.3%	17.3%	18.4%

1 This suggests that family and friends are a resource for a much wider range of Newcastle youth than is the case in, e.g. the United Kingdom. A set of studies commissioned by the UK office of Manpower Services Commission (1978) showed a total of 42% in an unemployed sample and 23% in the unemployed section of a much wider national young people survey using these methods of job finding. In the employed section of this latter survey, 31% obtained their first occupations through family or personal contacts. (pp.16, 42).

Another possible indicator of family influence was the fact that father's occupation was related to later job status (x^2=17.101 df=8 <.05) with more students having fathers in small business or clerical occupations and few unemployed having fathers in skilled trades. There was no relationship however between father's occupation and whether jobs were obtained through personal contact or otherwise. Thus, though over one-third of school leavers owed their jobs to the influence of family and friends no clear pattern of influence from families on groups of leavers has yet emerged.

4.3 Personal Factors

Among personal factors which might be considered as resources in future careers persistence, the sex of the leaver and general ability will be considered.

4.3.1 Persistence

Firstly, persistence is recognised as important for a frequent question raised about school leavers who remain unemployed is whether they "really try" for jobs. Most (87%) of the leavers in this sample, irrespective of job status, believed that "people can usually do what they want if they set their minds to it", and only 8.6% felt it was "a matter of luck"; nor were there any significant differences found between those who obtained work and those who were unemployed in the number of efforts made in phoning or writing or in filling in application forms. Furthermore the efforts made were considerable. Despite 34.1% of those employed not needing to take any special initiative in finding a job, 45.1% of those employed and 60.5% of those unemployed had phoned or written or personally called on firms on more than 5 occasions, while a number volunteered the information that they had initiated activity 30 to 50 times. In addition, a significant difference between groups on the first thing they did after leaving school (x^2=39.736 df=6 <.001) indicated a disproportionate number of the employed going to prearranged jobs (27.5%), students going on holidays (66.1%), and the currently unemployed looking for permanent jobs (57.9%).

Nor were school leavers unduely discouraged by the number of efforts they made but they were influenced by the response to those efforts. Those making 1 application were more likely to feel good about it than those making 5 or more (x^2=10.216 df=4 <.05) but feelings were more directly associated with the numbers of replies received, whether favourable or otherwise. Only 47.7% had received replies to all their applications. These had felt good about the process, but those who had not had replies to 5 or more applications felt negative (angry,depressed) about the process. The percentage of people informed of the results of an interview was higher (60.84%) but those few (N=6) who had more than 5 interviews without replies again felt negative (5) or neutral (1). A reasonable courtesy from employers at slight extra cost might help to minimise discouragement, particularly as the number of initiatives taken have no significant relationship with job status. Some of those employed seem mystified that a particular attempt had succeeded where many similar ones had not.

4.3.2 Differences between Sexes

A personal factor which was related to job status was the differences between the sexes. Not only were there differences in job status but also in the means by which jobs were obtained; yet these differences were probably at least partly influenced by the jobs sought[1] which in turn were related to preferred school subjects.

1 In 1977 a report on youth employment in the Hunter Region recommended the regionalisation of State and Federal government departments and the provision of incentives to other employers of clerical workers to expand the opportunities for clerical work in the region (B. Callaghan & S Vile). As noted section 3.4, more girls would prefer clerical occupations.

Though the numbers involved in such differences were not large, a tendency towards traditionalism was found in preferred school subjects. Preferences for mathematics were equal but girls tended to prefer languages and literature, art, music and social science whereas boys preferred science and practical subjects (x^2=24.828 df=6 < .001). This preference by boys was then reflected in their choice of occupation, whereas there was less match of school subjects with selected occupation for girls (x^2=10.053 df=2 < .01) On the other hand girls more than boys felt that the part-time work they had while at school helped them in deciding on a later career and in understanding working conditions, again possibly because of job preferences.

There were no differences between sexes in those obtaining part-time work while at school (total of 52.7%) but part-time work had no apparent influence on future job status. Differences did exist between the sexes, however, in more permanent job status (x=16.11 df=3 < .005).

TABLE 14

JOB STATUS AND SEX

Current Job Status	Male	Female	Total	%
Unemployed	13	25	38	20.5
Students	22	34	56	30.3
Permanent Job	52	25	77	41.6
Temporary Job	6	8	14	7.6
	93	92	185	

Clearly more males were in permanent jobs and more females unemployed or students.

Differences also occurred between the sexes in the way in which jobs were obtained (x^2=19.67 df=3 < .001) in that most employed men obtained their jobs through personal contact (45%) or answering advertisements (45%) whereas 41.7% of women gained their jobs by calling on the firm and personal contact was useful for 30.6%.

Yet there were no sex differences among school leavers in their belief that "women have as much right as men to a good job" (76.8%) as against it being "more important for a man to get a good job". (20.5%) Furthermore, there were only 10 of the 92 women who expected to be married with children and not working at 25 years. Other people (37.8%) expected to progress along their present lines (61.4% of these being students), to change jobs (35.7% with 51.5% of these being currently employed) and to have the same job (11.9%). It would appear that women do expect to have jobs but have not yet chosen to have similar jobs to men and are not yet equally able to obtain employment.

4.3.3 General Ability

Lest it be thought that credentials and job status both equate with general ability as measured by the Vocational Guidance Bureau it is necessary to mention that while school credentials were related to general ability (x^2=66.489 df=6 <.001) this ability had no significant relationship with job status. Similarly numerical and non-verbal sub-scores were not related to job status but full-time students were found to be significantly above average on the verbal score.

A check on complexity of reasoning as reflected in answers to whether young people did not want to work or whether there were not enough job opportunities similarly showed no relationship with job status. Further, though complexity of reasoning was related to credential levels (x^2=13.283 df=6 < .05) on

this question those with a low level H.S.C. had highest level answers. It seemed likely that these were capable people giving more thought to the issue than those with a higher H.S.C. who may have been postponing thinking about employment until after further studies. This highlights the importance of immediate experience in focussing the abilities of the individuals for effective operation.

5. Conclusions

For most people leaving school means thinking about getting a job. School, at least in retrospect, was for getting credentials or for helping to get a job. Moreover, having some credentials did help to get a job though not as directly as might have been assumed. Careers education at school, especially work experience, was appreciated and useful when it was informative and the school was the most frequently mentioned resource for many job seeking skills, yet actually getting a job was not related to knowing about these skills, and for a third of those employed the help of family and friends was decisive.

For the substantial minority of leavers who went on to full-time study, school had a somewhat different meaning. Given the appropriate credentials, school was as important for general education and personal development as for getting a job. Most of these folk had been the elite of the school, given more responsibilities and made aware of more feelings of success.

Those who left before year 10 were presumably handicapped, since only slightly more than half were employed. They were without credentials, had been deprived of most careers education except for personal development courses, had less information about jobs and had experienced more feeling of failure from school. Generally, they did not undertake further study. Yet their attitudes to work, their beliefs about society and their realistic optimism were the same as other school leavers. Their reasons for choosing jobs were similar to others, and they tried as hard to get permanent jobs.

Another presumably deprived group, which cut across all others, was the women. Influenced by their own preferences in work and by the ways in which jobs could be obtained when they were available, women were less successful in gaining employment. Despite these group differences in resources and experience, the school leavers in this sample were surprisingly homogeneous in belief and endeavour and in their conservative attitudes to the world of work.

The information gathered by this study can be seen as forming a potential input to the consideration presently being given in Australia to evolving curriculums for "transition" education and placing such education in a wider context (see Blakers, 1978, pp. 60-62). A later report on the second stage of the study will analyse whether the group differences described lead to increased divergence of attitude and activity by the end of the first year or whether post-school experiences assume dominance as they interact with various school, family and personal resources in a changing social context.

References

Blakers, C. Issues in Career Education, Australian Frontier Report, 1978.

Callaghan, B and Vile, S. Youth Unemployment in the Hunter Region, Social Report 9. Hunter Regional Council for Social Development, July, 1977.

Karmel, P. "Youth, Education and Unemployment", Australian Educational Researcher, 1980. 7, 1, 35-60.

Sturman, A. "From School to Work". Australian Education Review No. 13. Hawthorn, 1979. A.C.E.R.

U.K. Office of Manpower Services Commission, Young People and Work. London 1978 HMSQ.

ACTION RESEARCH IN RETROSPECT AND PROSPECT

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Why is it that the great army of teachers of Australian school children do not come to our conferences? It is not because we have concerns more profound or more esoteric than Australian teachers, but because our concerns are not (by and large) their concerns. We have taken the manifold world of schooling and broken it up into bits more amenable to our analyses[1]: we have adopted a perspective on schooling which allows us to view it as if it were a foreign culture. We do the former so that our analyses can be the more trenchant and so that our understanding of schools as social, economic and psychological systems can be placed within wider frameworks of social, economic and psychological understandings. We do the latter so that we have a means of overcoming the biases and susceptibilities of participatory ways of understanding -- so that we can develop a platform from which the world of schooling may be seen as a limited whole which may be comprehended "objectively". It is a natural consequence of our analytical fragmentation of the world of schooling[2] and our abrogation of participatory ways of understanding[3] that we no longer speak the language of teacners and students, that our concerns are not their concerns.

Those who do come to our conferences from the world of practice are policy-makers (or researchers, curriculum developers and evaluators whose role it is to serve policy-makers). We form a natural alliance with them. Like policy-makers, we deal in advice; like policy-makers we instrumentalise the world of practice under the aspect of our theories. The ethnographer Harry Wolcott (1977) sees the world of educators as "moiety-like": as divided into two broad social groups with different but related concerns: teachers and "technocrats". Educational researchers, administrators and policy-makers, he argues, are technocrats.

The observation that our work is not valued by teachers sufficiently for them to be here is not trite, though we have developed stock responses to explain or excuse the present state of affairs. We are "specialists", they are "generalists"; we are "theoreticians", they are "practitioners"; we are "scientists", they are the "field" about which our science is written.

We hope that our work will provide a source from which can issue a reconstruction of the world of schooling. There are two primary means by which we hope this reconstruction may be achieved: by application of the principles our science develops, or by insight into and understanding of the world of schooling based on reinterpreting that world from fresh perspectives. The first is a technical interest, the second a practical one (Habermas, 1972). The first approach construes educational systems as technologies for delivering knowledge and seeks to improve them as technology; the second construes education as a life-world that may be improved by understanding it under a different aspect (for example, by seeing schooling as a means of reproducing a meritocratic social structure).

Both these approaches to educational inquiry provide roles for the non-participant researcher. In the first case, the researcher appears in white overalls, re-designing and adjusting the great machine. In the second case, the researcher is seen in leather armchair, revising the language by which the life-world of education is discussed and understood. The caricatures are too glib, of course, but there is a truth behind the satire: that these approaches preserve a distance between the researcher and the researched

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which, on the one hand, preserves the independence of our fortunes from those of our "subjects", and, on the other, creates the necessity for bridges across the chasm we have created[4]: "application" or "reinterpretation" (translation of our understandings into words or symbols which can enter the lingua franca of practitioners).

It is argued that this disinterest is necessary if we are to improve or extend the "technology" or the "language" of practice. How else could knowledge reach beyond the confines of tradition, habit, system, or expectation? Against this, it may be argued that any means of "development" which does not, from the outset, involve development of the consciousness of practioners[5] necessarily creates a gap between those who possess knowledge which claims to be of vital importance in the development of practice and those who must have it for their work.

It is my belief, however, that it is we, the educational researchers, who have been dispossessed. In giving up the participatory modes of understanding of practice, we have distanced ourselves from the problems we intend to solve, or the lived experience we intend to interpret. We must justify ourselves to our "subjects" in terms of the (to-be-demonstrated) utility of the educational methods we propose, or the (to-be-experienced) validity and significance of the interpretations we offer.

There are a great many educational researchers of my acquaintance who experience the niggling of this crisis of legitimation[6] (simultaneously of their own work and of the work of education). Yet refuges are available in undeclared and unexamined metaphysical or ideological assumptions (in doctrinaire philosophies of science or political beliefs)[7,8], the elegance of analytical formulations[9], the mob-rule reassurance of a research literature, or the limited and pragmatic goal of techniques that "work"[10].

Still other researchers have come to terms with the problem in a different way. They have attempted to realise conditions under which they and the teachers whose work they hope to affect may form self-reflective communities of professionals as a basis for the simultaneous development of educational theory and practice. Some at least -- most notably Lawrence Stenhouse (1975, 1980), and John Elliott and Clem Adelman (1973a, 1973b) and John Elliott (1976, 1978) in recent years -- have seen their function largely in terms of educational midwifery: helping at the birth of the theory and practice of teachers as researchers, but hoping that the future development of the notion might take place in a self-critical community of professional educators.

This notion of teachers as researchers has attracted widespread interest in educational research, curriculum development, educational evaluation and in-service education. The interest is not new: indeed, it is best understood as a reawakening of interest in the notion of action research.

ACTION RESEARCH: RETROSPECT

The term "action research" was coined by the social psychologist Kurt Lewin in about 1944 (Marrow, 1969). He used the term to describe a form of research which could marry the experimental approach of social science with programs of social action in response to major social problems of the day. Through action research, Lewin argued, advances in theory and needed social changes might simultaneously be achieved.

Action research, according to Lewin, "consisted in analysis, fact-finding, conceptualisation, planning, execution, more fact-finding or evaluation; and then a repetition of this whole circle of activities; hence a spiral of such circles" (Sanford, 1970, p.4; see Lewin, 1946, 1947, 1952). Figure 1 represents this "spiral", attempting to incorporate the essential elements of Lewin's formulation:

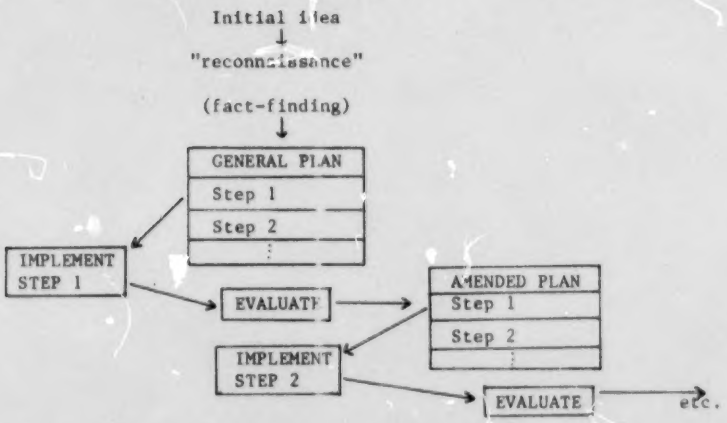

Figure 1: Action research as a spiral of planning, implementing, evaluating.

It is critical also to note that the "plan" in Lewin's formulation is a plan for a program of social action. Knowledge (theory) about social action could develop from observation of the effects of actions in context; simultaneously, social needs and aspirations might be met because action programs were aimed at addressing them directly (as action, not as principles which might later be applied in action).

Finally, it is critical to note that participants in the social world under investigation were to be involved in every stage of the action research cycle. Early experiments had showed the power of group decision in producing commitment and changes in attitudes and behaviour; action research was an attempt to incorporate group consciousness systematically into the research process.

Clearly, Lewin's formulation pressed against the boundaries of the prevailing epistemology. The "subjects" of research were now to take a central role in its formulation and execution; the research community was giving up its hitherto unchallenged hegemony in the social process of the generation of knowledge about social processes. Action research was (and is) an expression of an essentially democratic spirit in social research[11].

Some authors (like Corey, 1953) suggest that action research as an idea was first formulated by Collier, between 1933 and 1945 Commissioner of Indian Affairs for the U.S. Bureau of Indian Affairs. In 1945, Collier published a paper, "United States Indian administration as a laboratory of ethnic relations". He advocated "research and then more research" as essential to the program of improving the lot of the then-oppressed American Indians by democratic means. The kind of research needed was field research which responded to pressing social problems. On the basis of experience with this kind of research he concluded:

> Prescriptions of doing and prescriptions of avoidance are alike written plain be experiences. I have stated our ideal, that research should be evoked by needs of action, should be integrative of many disciplines, should involve the administrator and the layman, and should feed itself into action. In the actual event we have carried on research of this kind -- and we have also carried on research that was specialised, unintegrative and unconnected with action. In the latter case we have not meant to proceed in such a way, but have been forced into what we believed was the less productive method by administrative limitations, by premature, unforeseen stoppages of the enterprises, or by personal equations. We have learned that the action-evoked, action-serving, integrative and layman-participating way of research is incomparably more productive of social results than the specialised and isolated way, and also we think we have proved that it makes discoveries more central, more universal, more functional and more true for the nascent social sciences.

> But let me emphasize that this kind of research makes demands on the research worker that are far more severe than those made by the specialised and isolated kind. It requires of him a more advanced and many-sided training, and in addition a type of mind and personality which can sustain, in suspension, complex wholes which can entertain -- yes, and be drawn and impelled by -- human values and policy purposes while yet holding them disinterestedly far away. Such research lays on the participating administrator, too, a new kind of demand, and compels him to make in turn new kinds of demands on the system within which he works. And it requires elbowroom in the time dimension. ... I do suggest, however, that in the direction here implied, social science is now verging on a new epoch of methodology, of aim and of use, with all that this implies regarding careers for young minds and preparation for such careers. (pp.300-301)

It would be a mistake to see Collier as the sole originator of so grand a conception of social research. He used the term "research-action" to describe his idea of the process. But it is also true that he saw the process as cyclical: "action-research, research-action" (p.293).

Hodgkinson (1957), in a critique of action research, argues that the ideas which took shape in action research can be traced back to the beginnings of the scientific study of education at the turn of the century, that is, the use of scientific methods to study educational practices. In particular, he draws attention to the work of progressive educators inspired by the ideas of John Dewey. He quotes Dewey's The Sources of a Science of Education (1929):

> The answer is that (1) educational practices provide the data, the subject-matter, which form the problems of inquiry. ...These educational practices are also (2) the final test of value of the conclusions of all researches ... Actual activities in educating test the worth of scientific results ... They may be scientific in some other field, but not in education until they serve educational purposes, and whether they really serve or not can be found out only in practice. (p.33)

But the continuity of concern for research on education and its application in practice is far from adequate as an explanation of the emergence of action research as a new species of inquiry in education. In fact, it was precisely the continuity of that concern which stood in the way of the development of action research as a distinct species of inquiry.

In social science, especially psychology, the relation between theory and practice was understood to be a problem of application of the results of scientific researches. The model of the physical sciences had been a commanding one for educational sciences from perhaps 1920 onwards. The 1930's and 1940's saw behaviourism establish itself as pre-eminent among the contending approaches to psychological theory and methodology. It was as if the problems of practice could only be addressed from a firm, positive foundation in theory; from an adequate theory, enlightened practice might be expected to flow.

The power of the action research approach, by contrast, lay in its frank recognition of social problems, experienced in society at large, as the impulse to inquiry. If powerful theories were to be developed, they must address significant problems: theory and action might develop together from application of the scientific approach (rather than the findings of research).

What, then, were the problems which impelled the originators of action research?

The Second World War is crucial as a factor in understanding the rise of action research. The war raged around truly ideological themes: democracy and totalitarianism, egalitarianism and racial supremacy, the coexistence and subordination of peoples. It galvanised views about democratic decision-making processes and participation in those processes by those affected by the decisions, about the rights of

individuals and cultural and ethnic minorities to have their views heard and their special needs considered, and about tolerance for different views. In the wake of the War a major group of social psychological studies of prejudice, authoritarianism and dogmatism were undertaken often by psychologists who had themselves been the objects of prejudice as Jews in pre-War Germany (for example, Adorno et al., 1950, who studied the authoritarian personality). American social psychologists turned their concerns towards problems of prejudice within American society -- the problems of minority groups and of changing attitudes towards them because a central field in social psychology. Especially significant was the problem of intergroup relations.

But changing patterns of American society in other areas had also thrown up significant social problems. Industrialisation had brought with it a now-familiar pattern of migration from rural to urban areas; factory workers from rural areas performed differently from those experienced in factory life. There were major problems of production, some of which were related to the expectations of workers about the amount they could produce in a day, some related to the alienating conditions of factory life which gave workers no voice in decisions about production.

The social psychologist Lewin was intensely concerned with all of these problems. A German Jew, he had fled Germany in 1933. He is best known, perhaps, for his development of a "field-theoretic" approach in social psychology, but, apart from "action research", he was also the originator of the terms "group dynamics" and "sensitivity training".

Lewin's student and biographer, Alfred Marrow, depicts Lewin as an energetic, lively, sparkling intelligence, always open to questions posed by real incidents and concrete events. But he was also deeply concerned with questions of social action: persecution had driven him from Germany, so he was concerned about the broad social conditions which made prejudice possible. Moreover, Lewin appears to have been an intuitive leader of co-operative groups: he always worked best in critical dialogue with colleagues or groups of students. He was naturally drawn to study group processes.

Lewin saw that if social psychology was to contribute to action, it must be open to action as a source of its problems. But theory posed problems too: it would be wrong to describe him as motivated only by practical concerns. He had a long-term view of the complementary development of social scientific theory and social practice. Nevertheless, the magnitude and the significance of the problems of contemporary society drew Lewin from the university into consultancy relations with factories and social organisations, and eventually led him to establish a research institute which could be more "active" in developing social programs that traditionally-withdrawn academic research establishments could be. This was the Research Center for Group Dynamics, based at the Massachusetts Institute of Technology (though it subsequently moved, after Lewin's death in 1947, to the University of Michigan). This Center was the base from which Lewin developed many significant action research projects.

In the days before "action research" was coined as the label for the process, Lewin had worked in industrial consultancies. During the War, he participated (with the anthropologist Margaret Mead, among others) in studies of American food habits, which included attemtps to change the food habits of different groups. These studies led to explorations of leadership and group decision. But the research on intergroup relations provided perhaps the most fruitful field for action research which involved social programs to change attitudes and behaviour between and within ethnic groups.

Lewin's influence on social psychology has been described as so pervasive that it is difficult to identify particular fields of greatest contribution. In a sense, though, he remained on the edges of the

psychological establishment of the time. Perhaps this is because he challenged an orthodoxy about the role of the social scientist as disinterested, "objective" observer of human affairs.

It is this change of role that marks action research off from other approaches to the problem of the relation between theory and practice. Inevitably, the action researcher becomes involved in creating change not in artificial settings where effects can be studied and reported dispassionately, but in the real world of social practice. In action research, the intention to affect social practice stands shoulder to shoulder with the intention to understand it. The social problems manifested in and provoked by the Second World War created a new environment for social science, an environment in which the earliest action researchers believed that they could no longer pursue only understanding. They had been drawn into the field of action.

It was not long before Lewin's ideas on action research were being taken up widely. The most significant papers in the establishment of the bona fides of the method, though, were written by Lewin himself or by his students and colleagues from his time at Iowa (before establishing the Center at M.I.T.) and co-workers on projects at the Commission of Community Interrelations of the American Jewish Congress (e.g. Lippitt and Radke, 1946; Chein, Cook and Harding, 1948)[12].

Into Education[13]

The idea of action research was absorbed into education almost as soon as it originated. Lewin himself worked in action research programs with teachers and teacher educators. But his ideas were taken up most evidently in the work of the Horace Mann-Lincoln Institute of Teachers' College, Columbia Univeristy. The Institute was already engaged in curriculum development for social reconstruction and collaborative research with teachers, schools and school districts. Action research was a method which synthesised a range of contemporary concerns and provided a dynamic for collaborative programs of action in the schools. It was taken up quickly and influenced many of the Institute's projects in curriculum, teaching practice and supervision.

Action research existed as a "rallying-cry in the work of the Horace Mann-Lincoln Institute from about 1946 (Goodson, et al., 1946). By 1949, however, it was becoming especially identified with the name of Stephen Corey; over the next few years, Corey was to become its chief advocate in American education (e.g. Corey, 1949, 1950, 1952, 1953).

Soon the Institute had a major program of action research underway, generating a large number of reports of action research (see Wann, 1953, and Hodgkinson, 1957, for representative bibliographies). Elsewhere, too, action research was becoming accepted and tried.

But the years 1953-1957 saw the beginnings of a decline of interest in action research, at least in education. Wiles (1953) called for a sharpening of the concept of action research: it seemed to be all things to all men: research, in-service education, evaluation and supervision. Similarly, Corman (1957) wondered whether it was research or teaching. And, in the same year, Hodgkinson (1957) delivered a sharp critique of action research, condemning it as methodologically poor (in terms of statistical procedures), time-consuming, lacking follow-up investigation, incompatible with notions of general (rather than local) development of education systems, conceptually unclear, and, according to the epistemological canons of the day, unscientific.

There is not space in this paper to document the history of the decline of action research. Four interrelated factors seem to be involved. First, there was a retreat to the academy by researchers for whom the political economy of research production was best served by theoretic research and alliances with policy-makers rather than practitioners, called by Sanford (1970) a separation of action from research.

Second, there was an attack on the methodology itself: though action research had challenged the prevailing epistemology of positivistic research, it had not gone close to overthrowing it. Moreover, the guiding image of action research had been retrogressively interpreted and reinterpreted for (expected) positivist audiences until it lost its power as a model of the research process and became merely a version of positivistic research suitable only for teachers as "amateur" researchers[14]. Third, there were questions about whether action research had lived up to its promises in curriculum development and the improvement of school practices (Hodgkinson, 1957). It may also be that the progressive "unusefulness" of action research to practitioners themselves was a consequence of the retrogressive adaptation of action research towards the theoretic and policy-oriented interests of the academic advocates of action research[15]. And finally, there was a rise of other action-oriented and practically-relevant methods for educational inquiry as the curriculum development movement of the late 1950's and early 1960's provoked the development of educational evaluation (curriculum evaluation, program evaluation, school evaluation) with a bewildering variety of methodologies, guiding images and epistemologies[16]. The availability of these "alternatives" to action research may have abetted its displacement, while still providing an outlet for the practice-oriented impulse to inquiry among researchers.

The decline of major public interest in action research as a form of participatory research able to link theory and practice in the self-reflective and systematically "experimental" enterprise of a community of professional researcher-practitioners was, however, as evanescent as its period of major public development. It may be said that action research in education gathered its impetus in the years 1944-53 and declined from 1953-57, to be replaced by other action-oriented and practically-relevant methods of inquiry.

Through the 1960's and 1970's, however, action research continued in social program work. It re-emerged in education in the early seventies in Britain, partly because there had been continuing interest in it in other fields, especially (in Britain) through the work of the Tavistock Institute for Human Relations[17]. An account of this work up to 1970 may be found in Robert N. Rapoport's "Three dilemmas in action research" (1970)[18]. It seems that the Tavistock interest in action research provided a model for its adoption with teachers in the United Kingdom.

A large number of references may be found to action research in the period since 1957, after which time, it has been claimed, action research was no longer a major force in shaping American educational research. Nevertheless, it was "championed" by some eminent social scientists in that country from time to time throughout the post-1957 period (e.g. Campbell, 1974a; Sanford, 1970; Shumsky, 1958).

There has been a significant revival of interest in the notion in the United Kingdom (already indicated) and there are some signs of reawakening interest in educational research in the United States (e.g. Oliver, 1980)[19]. In Australia, too, there is a growing awareness of its potential (e.g. through the Schools Commission and in the work of a number of researchers, policy-makers and practitioners around the country)[20].

The current revival of interest in action research reflects contemporary trends and issues not unlike those of the mid-1940's. There is, for example, a strong interest among educational researchers in helping practitioners deal with problems of practice. Secondly, a broad methodological interest has developed in recent years in interpretative methods (for example, Hamilton, et al., 1977; Kemmis, 1980a; MacDonald and Walker, 1975; Parlett and Hamilton, 1976; Smith and Pohland, 1974; Stake, 1975; Wolcott, 1977) which indicates growing interest among researchers in defining the problems of the field in ways which represent

the understandings of practitioners. Thirdly, there is a growth of collaborative curriculum development and evaluation work. At least one aim of collaboration is to build practitioner commitment to the research enterprise. Fourthly, there is an explicit ideological commitment to addressing social and political problems of education through participatory research carried out by practitioners on problems of immediate and more general public concern, for example, in school-level evaluation as an aspect of local and general public accountability (see Davis, 1980) or in research on the uses of language in classroom learning (e.g. Curriculum Development Centre, 1978). In short, there is a trend towards reconceptualising the field of educational research in more participatory terms with regard to its problem-sources, subject-matter, methods, knowledge-products and community of inquirers (see Schwab, 1974).

It might be argued that these trends are simply towards practicality. Indeed, Schwab, (1969) has argued strongly for development of the arts of practical deliberation in distinction from theoretic research, and a large number of curriculum researchers have taken up the argument (for example, Reid, 1978; Walker, 1971, 1973). But taking the concerns of practitioners seriously has led to a more profound interest in their concerns: emancipating them from the concerns of professional researchers and making them researchers in their own right (for example, Stenhouse, 1975, 1980; Kemmis, 1980a)[21]. It is this deepening interest in awakening critical self-reflection among practitioners that has provoked interest in critical theory among some methodologists of educational research.

A DEVELOPING EPISTEMOLOGICAL FOUNDATION : CRITICAL THEORY

There is not space in this paper to indicate the depth and extent of the trends in epistemology and philosophy of social science which suggest that action research may once again become a major force in educational research. It is sufficient to our present purposes simply to indicate some aspects of critical social science which may underpin a revival of interest in action research methodology. However, although developments in critical social science provide such a basis, present formulations of critical theory have tended to be so abstract as to defy practical implementation in educational research[22]. Action research, I believe, provides workable procedures through which the aspirations of critical theory might be realised.

The companion paper by Robin McTaggart and Marita Fitzpatrick for this meeting spells out some of the essential features of the critical approach and proposes a form of action research which embodies the emancipatory interest of critical social science.

As McTaggart and Fitzpatrick show, there is a commonality of intent between action research and critical social science. Firstly, both share an interest in processes for the organisation of enlightenment (conscientisation) in communities bound by common interests. In distinction from the technical and practical interests of most educational research mentioned in the introduction to this paper, action research and critical social science share an emancipatory knowledge-constitutive interest[23]. That is to say, they share an interest in liberating communities of inquirers from the dictates of tradition, habit, bureaucratic systemisation and individual expectations. But the emancipatory interest is far from a sceptical response which breaks free of systemisation without establishing an orderly process for social and intellectual reconstruction[24]. On the contrary, action research and critical social science embody participatory democratic processes for social and intellectual reconstruction.

It is true that Lewin's formulation of these participatory processes for the organisation of enlightenment is more technically-oriented. Indeed, Lewin described it in terms of "social management" or "social engineering" (e.g. Lewin, 1947) before those terms came to have the even more technical connotations they have today. But Lewin was clearly impressed by the power of action research epistemology

to generate enlightenment in a participant community.

Second, both approaches embody a linking of the development of theory and practice through the efforts of a community of inquirers. According to positivistic and interpretative approaches, theory and practice may be developed separately. In action research, as in critical social science, any separation spells the end of the enterprise (see Sanford, 1970). Here again, however, one finds Lewin more willing to accept theoretical advance (without necessary practical advance)as indicative of progress; in Habermas, the two are mutually interdependent.

Thirdly, and in consequence of the joint development of theory and practice, both action research and critical social science provide the means for producing authentic critiques of practice, that is, critiques which are grounded in the life circumstances of the inquirers, yet able to transcend these circumstances through the development of "scientific discourse" (Habermas, 1974) about it[25]. What is significant here is that critical social science involves a process of objectification of its subject-matter (the social lives of those in the community of inquirers); it does not treat it "objectively" as frozen or inert. In doing so, it preserves the possibility of a reflexive social science (one which can comment on social life and be incorporated within participants' understandings without becoming less true of the situations studied). It transcends "subjectivism" and "objectivism" in an explicit dialectic between the "subject-world" and the "object-world". Though Lewin does not confront this problem directly, it seems evident that his general interest was in the development of social critique based on democratic control of the knowing (research) process.

Finally, it is clear that both action research and critical social science share an interest in the development and strategic use of programs of social action as tools for improving (simultaneously) both practice and knowledge about practice. D.T. Campbell (1969, 1977) explores the notion of "reforms as experiments" in a similar spirit, but Campbell's formulation is ultimately technical, not emancipatory, despite his familiarity with action research as a form of social research and development[26]. What distinguishes Campbell's work from that of Lewin and Habermas is his rationalism: theory is the basis for the principled development and justification of practice; theoretic developments are to be sought independently of the degree to which they influence the consciousness of practitioners. For Lewin and Habermas, social action can only be justified by reference to the commitments and authentic insights of practitioners.

There are significant differences between the epistemology of action research in the middle 1940's and the critical social science of more recent years. The prevailing conceptions of social science differ markedly, and one can imagine that the neo-Marxist intellectual frameowrk of critical social science would have been repugnant to a decidedly anti-Marxist research community (at least in the U.S.) in the years immediately following the Second World War. Most importantly, however,discussions of action research from the 1940's have a technical "flavour" which does not appear in critical social science: action research, in Lewin's view, was more than a technology for change (see, for example, Lewin, 1946), but his papers often discuss it in technological terms. It was probably this technical rhetoric which permitted the retrogressive reinterpretation of action research discussed earlier.

Critical social science appears as a far more complete epistemology than Lewin's action research. It has been the argument of this paper that historical circumstances, as well as Lewin's personal vision of a "practical" yet theoretically-sophisticated social science, shaped action research as a precursor of critical social science (in the chronological if not the causal sense).

Why then discuss action research at all? There are two main reasons: first, action research already

has a place in the history of educational and social research upon which contemporary practitioners can build[27]; and second, because action research provides a simple, practicable guiding image for doing critical social science which theoretical accounts have so far failed to furnish. This latter reason is compelling: the failure of critical social science to attract more than a few adherents in contemporary educational research is probably due (more than anything else) to a stubborn refusal of European critical theorists to democratise (and thus justify) their methods by making them intellectually accessible to a wide audience. Educational researchers have lacked both a way of doing critical social science and the epistemological foundations by which it may be justified[28]. Yet critical social science does provide a remedy for the crisis of legitimation mentioned in the introduction to this paper: a means of simultaneously developing theory and practice, and defining a socially-responsible role for the researcher as a participant in the self-reflective community of practitioners.

ACTION RESEARCH IN AUSTRALIA

The ERDC "Research on Action Research" Project (directed by the author) has begun to gather together some of the diverse strands of interest in action research in Australia[29]. It can be identified (explicitly or implicitly) in work in teacher-research, curriculum development, in-service education, school-level evaluation and teacher education. In some cases, projects are avowedly "action research" projects; in other cases, they are action research in all but name (for example, the work of the Tasmanian Education Department as part of the Schools Commission's School-Level Evaluation Initiative; Tasmanian Education Department, 1980).

Preliminary analysis suggests that the theoretical prospects for action research are only moderate, if "theoretical" pay-off is measured in terms of the literature of professional educational researchers. There are pay-offs in terms of theories of language and learning and the theoretical/methodological literature of evaluation, but by and large the knowledge pay-offs of action research are for practitioners rather than "academic" researchers. If theoretical pay-off is defined in terms of the development of critical communities of practitioners, then the results are far more encouraging. This, after all, is the aim of both action research and critical social science. It remains to be seen whether the pay-off can be sustained in a research literature established by practitioners for practitioners; if it can, then dissemination of the fruits of action research might take place across wider frontiers. The Classroom Action Research Network established by John Elliott and the Ford Teaching Project[30] provides a model of what might be achieved.

The organisational and practical prospects for action research are good, it seems. Interest in school-based curriculum, school-based in-service education, school-level evaluation and practitioner research has established a range of modes of work (individual, co-operative, collaborative between schools and tertiary institutions), a variety of foci (school improvement, curriculum improvement, the improvement of classroom practice), and a variety of support mechanisms (tertiary institutions, Schools Commission, education department consultants, etc.) for action research. Despite widespread fears about trends to centralisation in some quarters of Australian education (the Green Paper in Victoria, "back to the basics" rhetoric, national assessment of school performance, etc.), many Australian teachers, consultants and researchers who have developed a taste for critical self-reflection through action research seem unwilling to give it up. Though it is demanding of time and individual effort, requires the development of new skills and perspectives, and opens individual teachers and schools to criticism (when they allow others to see that they are willing to confront problems and issues rather than deny them), it is nevertheless valued by many who have explored its possibilities. But there is evidence, too, that some teachers and schools find the

enterprise insufficiently rewarding. It may promise more than it can deliver, it may create political problems in implementation of action plans, it may polarise staff, it may be used mischievously to "prove" that one alternative educational strategy is better than another, it may fail to come to grips with complex issues sufficiently quickly, it may be superficial, and it may breed dependency on "legitimate" facilitators of the action research process in tertiary institutions or education departments.

Nevertheless, there is evidence that action research in Australia is a field sufficiently well-developed to have signficiant substantive and methodological problems [31]. Not the least of these is that of defining the boundaries of action research and the limits of its potential. These are among the problems currently being investigated by the ERDC "Research on Action Research" Project.

NOTES:

1 cf. J.T. Hastings: "That these techniques have been and will continue to be useful for some parts of some of our problems is obvious. Unfortunately, we have frequently failed to note that considering them 'the right' methods may cause us to alter the very nature of the problems on which we work. certainly such emphasis will narrow our conceptual field in our attacks on educational problems" (p.127)

2 cf. Kemmis, 1978 on "componentisation".

3 cf. Kemmis, 1980a on "conviviality" and "the technologisation of reason".

4 For an analysis of this problem, see Carr, 1980a, 1980b.

5 cf. Freire's notion of "consientization". Berger, Berger and Kellner have this to say explaining the notion: "Originally the term, as used by Freire, simply meant that adults could be taught anything more readily if the teaching was related to the primary concerns of their everyday life. (Freire was originally concerned with teaching literacy.) The term, however, has come to mean much more than that, both in Freire's own work and in its wide diffusion among radical intellectuals throughout Latin America. Conscientization now means the entire transformation of the consciousness of people that would make them understand the political parameters of their existence and the possibilities of changing their situation by political action. Conscientization is a precondition of liberation. People will be able to liberate themselves from social and political oppression only if they first liberate themselves from the patterns of thought imposed by the oppressors". (pp.175-176)

6 See J. Habermas Legitimation Crisis (1973).

7 Consider, for example, the contradictions experienced by Neville Bennett (1976) who, originally an advocate of "informal" education, found "formal" methods generally more "successful" -- while failing to note that the positivistic epistemology on which his research methods were based was in opposition to the epistemology of "informal" education. (See J. Piaget "The New Methods: Their Psychological Foundations", in J. Piaget Science of Education and Psychology of the Child, originally written in 1935, for a discussion of the epistemology of "informal" approaches.)

8 cf. Ben Morris: "Can those who carry out educational research safely ignore that part of their subject [philosophy] which underlies their own investigations? Although in practice, I should not expect every report on a piece of educational research to raise all the assumptions on which it is based or to touch on all the implications of its results, nevertheless, I think that we ignore them at our peril. For if we do so, we cannot claim to be educationists but must be content with being a species of laboratory technicians without the right to any expert voice in matters of educational policy ... If we are merely technicians, we cannot claim to be able to criticize the educational foundations and implications of our own work. This means quite simply that we cannot claim to know what we are doing". (pp.60-61)

9 cf. Sir Isaac Newton's remark: "I do not know what I may appear to the world, but to myself I seem to have been only a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay undiscovered before me".

10 As, for example, in the success of the DISTAR program which, while it may produce increases in measured learning outcomes, does so at the expense of creating conditions for learning which foster dependence, and the technologisation and bureaucratisation of consciousness (cf. P. Berger, B. Berger and H. Kellner, 1973) as against the liberation of the individual and the learning group through knowledge.

11 These ideas are closely parallel to some of the central notions of critical theory as expressed by Jurgen Habermas (1972, 1974). We have not yet established the degree to which Habermas's ideas and those of Lewin could be a common expression of trends in German philosophy of social science prior to the Second World War. Yet we do not need to "force" the ideas of Lewin into the framework of critical theory to pick up the resonances: the perspectives share a common concern with unconstrained communication, participatory processes, a focus on problems of concern and consequence to participants, and an active role for the research process as an operational rationality able systematically to remake social conditions on a major scale. There are, of course, major differences: especially in Lewin's somewhat technical perspective on the research process (to be distinguished from Habermas's "emancipatory" perspective on the process of critical social science).

12 These two papers were important in creating the public "image" of action research. It is of interest, however, that elements of the Chein, Cook and Harding paper betray a more conventional view of action research than Lewin's view of its potential. To anticipate: it is signficant, in view of the relative demise of action research over the following decade, that the Chein, Cook and Harding paper discussed

action research in terms much closer to the prevailing philosophy of social science. One wonders whether, had Lewin lived, the notion might have been more securely established and have gained an even wider acceptance in the social research of the 1950's and beyond.

13 I am indebted to Lori Beckett, a research student at Deakin University, for historical work in this area.

14 The process of reinterpretation from Lewin to Chein, Cook and Harding (1948) and Benne, et al. (1948), to Corey (1953) and Taba and Noel (1957) suggests that the adaptation was retrogressive, towards a redefinition of action research in positivistic terms. Lori Beckett's work at Deakin University provides some evidence that the process was retrogressive in this sense.

15 This hypothesis is to be explored in future research; certainly Sanford (1970) argues that there was a "drift" of interests among academic researchers away from the problems of the field as defined by its practitioners. See also M. Rein (1976) and I. Deutscher and M. Gold (1979).

16 See Kemmis (1980a) for one critical perspective on this development.

17 Lewin had visited Britain in 1933 and 1936 and established links with Eric Trist who, with A.T.M. Wilson prepared a proposal to the Rockefeller Foundation which led to the establishment of the Tavistock Institute. Lewin's Research Center for Group Dynamics at M.I.T. and the Tavistock Institute remained in close contact and jointly established the journal Human Relations (for which Lewin wrote four articles).

18 This is the only explicit reference to action research in the early work of Elliott and Adelman and the Ford Teaching Project. Elliott (personal communication) indicates that Lawrence Stenhouse was also a source for him on action research; the author has not yet established Stenhouse's sources.

19 John Elliott (personal communication) suggests that there is also an interest in action research in continental Europe. Brock-Utne (n.d.) gives an account of some German language literature on the subject between 1966 and 1978, referring especially to the work of Prof. Wolfgang Klafki. In the German literature the link between action research and critical social science is apparently quite explicit. It is hoped that the "Research on Action Research" Project will be able to follow up this line from German sources.

20 We will return to some of these Australian initiatives in a later section.

21 The interest is parallel with Freire's notion of conscientization. See note 5 above.

22 Few practitioners have the fortitude to tackle Habermas as a possible solution to their problems of methodology!

23 Knowledge-constitutive interests are the interests which guide and shape inquiry. (See Habermas, 1972; the Appendix gives a succinct formulation.)

24 See Kemmis, in press, for a discussion of the problem of scepticism.

25 As Habermas (1974) remarks, in discourse, the compulsions of action are virtualised (p.19).

26 In his "Qualitative Knowing and Action Research" (1974a), Campbell acknowledges Lewin's influence on his thought. It is also evident in his "evolutionary epistemology" (1970, 1974b) that he adopts an extremely sophisticated position on the evolution of knowledge. It would seem quite possible that Campbell could embody the two sets of ideas (about the evolution of knowledge and the organised development of practice) and generate a powerful contemporary model of action research.

27 It is important to note that action research in social work did not seem to undergo the retrogressive reinterpretation that action research in education underwent. Indeed, in social work it is still alive at least in the United Kingdom, North America and Australia. In particular, it has been linked with citizens' action campaigns: clearly an embodiment of the democratic spirit breathed into it at its birth.

28 Positivist social science has been singularly successful in establishing its guiding image as the guiding image for research. Hence Habermas's sharply critical comments on scientism (science's belief in its own efficacy) in discussing the reinterpretation of epistemology as philosophy of science (Habermas, 1972; the criticism is plain in the Introduction, and argued through in the remainder of the volume).

29 The Interim Report of the project (Kemmis, 1980b) to ERDC indicates something of the range of contemporary interest.

30 Based at the Cambridge Institute of Education, Shaftesbury Road, Cambridge, England. The Network publishes a bulletin for its members which disseminates action research experience among action researchers.

31 At a recent meeting of some Victorian action researchers at Deakin University, the following issues were among those mentioned as requiring discussion, analysis and "experimentation": the functions of reporting; the potential of various techniques; the theoretical foundations of action research; the roles available to students, parents and the school community in action research; action research on learning for students; the role of action research in school-level evaluation and accountability; problems of information-sharing; and substantive concerns especially suited to action research (e.g. assessment and reporting).

REFERENCES:

ADORNO, T.W. et al. The Authoritarian Personality. New York: Harper and Row, 1950.

BENNE, K.D. et al. The Horace Mann-Lincoln Institute of School Experimentation : A progress report. Teachers College Record, 1948, 49, 305-362.

BENNETT, N. Teaching Styles and Pupil Progress. London: Open Books, 1976.

BERGER, P., BERGER, B. and KELLNER, H. The Homeless Mind : Modernization and Consciousness. New York: Random House, 1973.

BROCK-UTNE, B. What is educational action research? University of Oslo (mimeo), n.d.

CAMPBELL, D.T. Reforms as experiments. American Psychologist, 1969, 24, 409-429.

CAMPBELL, D.T. "Natural Selection as an Epistemological Model". In R. Naroll and R. Cohen, A Handbook of Method in Cultural Anthropology. Garden City, New York: Natural History Press, 1970.

CAMPBELL, D.T. "Qualitative Knowing in Action Research". Northwestern University (mimeo); transcript of the Kurt Lewin Memorial Address presented to the Annual Meeting of the American Psychological Association, September 1, 1974a.

CAMPBELL, D.T. "Evolutionary Epistemology". In P.A. Schilpp (ed.) The Philosophy of Karl Popper, Vol. 14, I and II, The Library of Living Philosophers. LaSalle, Illinois: Open Court, 1974b.

CAMPBELL, D.T. "Keeping the Data Honest in the Experimenting Society". In H.W. Melton and J.H. Watson (eds.) Interdisciplinary Dimensions of Accounting for Social Goals and Social Organizations. Columbus, Ohio: Grid, Inc., 1977.

CARR, W. The gap between theory and practice. Journal of Further and Higher Education, 1980a, 4 (1), 60-69.

CARR, W. Philosophy, fantasies and common sense. Journal of Further and Higher Education. 1980b, 4 (2), 89-97.

CHEIN, I., COOK, S. and HARDING, J. The field of action research. American Psychologist, 1948, 3, 43-50.

COLLIER, J. United States Indian Administration as a laboratory of ethnic relations. Social Research, 1945, 12, 265-305.

COREY, S.M. Action research, fundamental research and educational practices. Teachers College Record, 1949, 50, 509-14.

COREY, S.M. Teachers as investigators. Progressive Education, 1950, 27, 131-132.

COREY, S.M. Action research by teachers and the population sampling problem. Journal of Educational Psychology, 1952, 43, 331-338.

COREY, S.M. Action Research to Improve School Practices. New York: Teachers College, Columbia, 1953.

CORMAN, B.R. Action research : A teaching or a research method? Review of Educational Research, 1957, 27, 544-546.

CURRICULUM DEVELOPMENT CENTRE. Base Paper for the Curriculum Development Centre's National Working Party on the Role of Language in Learning. Curriculum Development Centre, Canberra, 1978.

DAVIS, E. Teachers as Curriculum Evaluators. Sydney: George Allen and Unwin, 1980.

DEUTSCHER, I. and GOLD, M. Traditions and rules as obstructions to useful program evaluation. Studies in Symbolic Interaction, 1979, 2, 107-140.

DEWEY, J. The Sources of a Science of Education. New York: Liveright Publishing Co., 1929.

ELLIOTT, J. Preparing teachers for classroom accountability. Education for Teaching, 1976, (summer) 100.

ELLIOTT, J. What is action research in schools? Journal of Curriculum Studies, 1978, 10, 355-357.

ELLIOTT, J. and ADELMAN, C. Reflecting where the action is : The design of the Ford Teaching Project. Education for Teaching, 1973a, 92, 8-20.

ELLIOTT, J. and ADELMAN, C. Supporting teachers' research in the classroom. New Era, 1973b, 54, 210-215.

FREIRE, P. Pedagogy of the Oppressed. New York: Herder and Herder, 1970.

GOODSON, M., et al. Charting a course for educational progress. Teachers College Record, 1946, 45, 35-60.

HABERMAS, J. Knowledge and Human Interests, trans. J.J. Shapiro. London: Heinemann, 1972.

HABERMAS, J. Legitimation Crisis, trans. J. McCarthy. London: Heinemann, 1973.

HABERMAS, J. Theory and Practice, trans. J. Viertel. London: Heinemann, 1974.

HAMILTON, D. et al. Beyond the Numbers Game : A Reader in Educational Evaluation. London: Macmillan Ed., 1977.

REFERENCES CONT'D

HASTINGS, J.T. The kith and kin of educational measurers. Journal of Educational Measurement, 1969, 6, 127-136.

HODGKINSON, H.L. Action research -- A critique. Journal of Educational Sociology, 1957, 31 137-153.

KEMMIS, S. Nomothetic and idiographic approaches to the evaluation of student learning. Journal of Curriculum Studies, 1978, 10, 45-59.

KEMMIS, S. "Program Evaluation in Distance Education : Against the Technologisation of Reason". In J.D. Armstrong and R.E. Store (eds.) Evaluation in Distance Education. Townsville, Queensland: Townsville College of Advanced Education, 1980a.

KEMMIS, S. Interim Report of the "Research on Education Research" Project to the Education Research and Development Committee. Deakin University (mimeo), 1980b.

KEMMIS, S. "The Imagination of the Case and the Invention of the Study". In H. Simons (ed.) Towards a Science of the Singular, in press.

LEWIN, K. Action research and minority problems. Journal of Social Issues, 1946, 2, 34-46.

LEWIN, K. Feedback problems of social diagnosis and action. Human Relations, 1947, 1, 147-153.

LEWIN, K. "Group Decision and Social Change". In T.M. Newcomb and E.E. Hartley (eds.) Readings in Social Psychology. New York: Holt, 1952.

LIPPITT, R. and RADKE, M. New trends in the investigation of prejudice. Annals of the American Academy of Political and Social Science, 1946, 244, 167-176.

MacDONALD, B. and WALKER, R. Case study and the social philosophy of educational research. Cambridge Journal of Education, 1975, 5, 2-11.

MARROW, A.J. The Practical Theorist : The Life and Works of Kurt Lewin. New York: Basic Books, 1969.

MORRIS, B. Objectives and Perspectives in Education. London: Routledge and Kegan Paul, 1972.

OLIVER, B. Action research for in-service training. Educational Leadership, February, 1980, 394-395.

PARKLETT, M. and HAMILTON, D. "Evaluation as Illumination : A New Approach to the Evaluation of Innovative Programs". In D.A. Tawney (ed.) Curriculum Evaluation Today : Trends and Implications. London: Macmillan Education, 1976.

PIAGET, J. "The New Methods : Their Psychological Foundations". First published in French in 1935. In J. Piaget Science of Education and Psychology of the Child, trans. D. Coltman. London: Longman, 1971.

RAPOPORT, R.N. Three dilemmas in action research (with special reference to the Tavistock experience). Human Relations, 1970, 23, 1-11.(?)

REID, W.A. Thinking about the Curriculum : The Nature and Treatment of Curriculum Problems. London: Routledge and Kegan Paul, 1978.

REIN, M. Social Science and Public Policy. Harmondsworth, Middlesex: Penguin, 1976.

SANFORD, N. Whatever happened to action research? Journal of Social Issues, 1970, 26, 3-23.

SCHWAB, J.J. The practical : A language for curriculum. School Review, 1969, 78, 1-24.

SCHWAB, J.J. Decision and choice : The coming duty of science teaching. Journal of Research in Science Teaching, 1974, 11, 309-317.

SHUMSKY, A. The Action Research Way of Learning. New York: Teachers College, Columbia, 1958.

SMITH, L.M. and POHLAND, P.A. "Education, Technology and the Rural Highlands". AERA Monograph Series on Curriculum Evaluation, No. 7, Chicago: Rand McNally, 1974.

STAKE, R.E. (ed.) Evaluating the Arts in Education : A Responsive Approach. Columbus, Ohio: Charles E. Merrill, 1975.

STENHOUSE, L. Introduction to Curriculum Research and Development. London: Heinemann Education, 1975.

STENHOUSE, L. Curriculum research and the art of the teacher. Study of Society, April, 1980, 14-15.

TABA, H. and NOEL, E. "Steps in the Action Research Process" (from Action Research : A Case Study, Association for Supervision and Curriculum Development, N.E.A., Washington, D.C., 1957). Reprinted in B.M. Harris (ed.) Supervisory Behaviour in Education. Englewood Cliffs, N.J.: Prentice-Hall, 1963.

TASMANIAN EDUCATION DEPARTMENT. Submission to the Schools Commission's School-Level Evaluation Initiative, 1980.

WALKER, D.F. A naturalistic model for curriculum development. School Review, 1971, 80, 51-65.

WALKER, D.F. What curriculum research? Journal of Curriculum Studies, 1973, 5, 58-72.

REFERENCES CONT'D

WANN, K.D. Action research in schools. Review of Educational Research, 1953, 23, 337-345.

WILES, K. Can we sharpen the concept of action research? Educational Leadership, 1953, 10, 408-410.

WOLCOTT, H. Teachers vs Technocrats : An Educational Innovation in Anthropological Perspective. Centre for Educational Policy and Management, University of Oregon, Eugene, Oregon: 1977.

SEE ALSO :

McTAGGART, R. and FITZPATRICK, M. "The Requirements of a Successful Action Program". Paper presented to the Annual Meeting of the Australian Association for Research in Education, Sydney, November 6-9, 1980.

SOME REACTIONS TO PROFESSOR KARMEL'S 1979 RADFORD MEMORIAL LECTURE ON YOUTH, EDUCATION AND EMPLOYMENT[1]

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Introduction

Professor Karmel's Radford Memorial Lecture on the topic "Youth, Education and Employment" is important for three main reasons. Firstly, it makes readily available demographic trends concerning the education, training, employment and unemployment of youth, and sets these trends within a context; secondly, many of the recommendations it contains would have to be applauded by persons concerned with the education and general welfare of youth and thirdly, Karmel's approach to this topic seems to have influenced the Federal Government in their recent formulation of a policy on transition from school to work (Carrick, 1979; Carrick and Viner, 1979). Despite this importance, certain aspects of Karmel's lecture give reason for concern and merit comment. In this brief reaction paper four main aspects will be addressed.

I. Karmel's implication that increases in the unemployment benefit paid to youth in 1973 and 1974 contributed to the decline in the secondary school retention rate for males

In his lecture, Karmel states that "For males retention reached its peak in 1972 and since then has declined quite significantly" (1980:38). He further states that

> There is little doubt that recent trends in retention have been influenced by the shortage of full-time jobs and by changes in unemployment benefits. The shortage of jobs acts to encourage both early leaving, as scarce jobs become available and are seized by young people, and retention, as young people decide that it is better to stay at school and obtain higher qualifications than waste time looking for non-existent jobs. Unemployment benefits for 16 and 17 year olds increased sharply in 1973 and 1974 thus altering the balance of incentives between staying at school and leaving and receiving the dole; indeed the decline in retention for males appears to date from these increases in benefits. These factors have operated differently for males and females. In the case of girls, full-time employment opportunities have declined much more sharply than for boys; this, combined with perhaps a greater reluctance for parents to see their daughters on the dole, may account for the differential retention trends of boys and girls. (1980:39-40).

This implication that increases in the dole contributed to the decline in the secondary school retention rate for males is important, for it constitutes part of the basis for Karmel's contentious recommendation that "Unemployment benefits would be available only as a last resort" (1980:56) to young people in his rationalised financial scheme.

Several objections may be made to this implication that the decline in the secondary school retention rate for males is partly due to increases in the unemployment benefit. To make the implication at all plausible, Karmel is forced to account for why a similar decline in retention rate has not occurred for females. As shown above, he does this in part by noting that employment prospects for girls have recently been worse than those for boys, and hence fewer girls have been enticed away from school by job opportunities. This aspect of his account seems fairly plausible. However, his further suggestion that "... a greater reluctance for parents to see their daughters on the dole" (1980:40) may help explain this sex difference in retention patterns seems speculative, and no supportive evidence is cited by Karmel.

The actual demographic statistics on which Karmel bases his implication are also worth close attention, and they are reproduced here in Table 1. While a gradual decline in secondary school retention to the final year is apparent for males, and while an opposing increase in retention is apparent for females, the actual magnitudes and fluctuations within the trend for males should be considered. The maximum decline for males over any one year period is 1.1% from 1973 to 1974, a decline which would probably involve fewer than 1,500 males opting not to continue with their schooling.[2] Furthermore, if a decline of 1.1% is seen as being influenced by an increase in the unemployment benefit, one might wonder what influenced the almost as large a decline of .9% from 1977 to 1978, or the increase of .5% from 1974 to 1975? Karmel thus seems to have placed too much weight on a fairly small and erratic trend in implying that increases in the dole contributed to the decline in the male retention rate to the final year of secondary school.

Table 1*

APPARENT (a) RETENTION RATES TO COMPLETION OF SECONDARY SCHOOL AUSTRALIA 1967 to 1978

	Males	Females	Persons
	per cent	per cent	per cent
1967	26.5	18.7	22.7
1968	28.5	21.2	25.0
1969	31.1	23.7	27.5
1970	33.0	25.5	29.3
1971	34.1	26.9	30.6
1972	35.7	28.9	32.4
1973	35.2	30.8	33.1
1974	34.1	31.6	32.8
1975	34.6	33.6	34.1
1976	34.6	35.3	34.9
1977	34.0	36.6	35.3
1978	33.1	37.2	35.1

(a) Ratio of final year enrolments to enrolments in the first secondary school year when the cohort of that school year commenced.
Source: ABS Cat 4202.0; Commonwealth Department of Education.
*From Karmel (1980:39, Table 2).

Another problem concerning the actual demographic statistics on which Karmel bases his implication is that these statistics are for Australia as a whole. Table 2 outlines the retention rates for males to the final year of secondary school, but on a state and/or territory basis. What is shown by these state statistics is that the Australia-wide trend to which Karmel refers is not found within all states. In fact, only New South Wales really shows the Australia-wide pattern of a peak in retention in 1972 followed by a steady decline. The two aspects of this pattern, the peak and the steady decline, will be discussed in turn.

With respect to peak retention, it is apparent that most states peaked in some year other than 1972. Only New South Wales and South Australia (the latter reaching just as high a retention rate in 1975) had peak retention in 1972. Two states (Victoria and Northern Territory) peaked in 1973, the very year in which the increase in the dole introduced in March (Windschuttle, 1979:52) might have been expected to have reduced retention, according to Karmel's implication.[3] One state (Tasmania) peaked in 1975, another (Western Australia) in 1976, and two states (Queensland and the Australian Capital Territory) peaked in 1978. With respect to the steady decline in the retention rate for males after 1972 found in the Australia-wide statistics, again only New South Wales really shows this pattern. Some states show a

decline for a few years after 1972, but it is followed either by a sudden increase and then a sharper decline (South Australia and Tasmania, while Victoria also showed a late sharp decline after erratic earlier fluctuations), or by a sustained increase in retention (Queensland and the Australian Capital Territory). Even more deviating from the Australia-wide trend is Western Australia which experienced a steady increase in the male retention rate from 1972 until 1976, followed by a sharp decline thereafter. Generally then, sharper declines in the male retention rate occurred within the states in the later part of the 1972 to 1978 period, rather than in the earlier part.

The significance of this examination of retention rates within the different states is that it makes clear that Karmel needs to go beyond the Australia-wide trend if his implication that increases in the dole contributed to the decline in the male retention rate is to be plausible, for the steady decline observed for the Australia-wide statistics is not found within most states. Karmel needs to explore and explain these state differences. Even though he sees multiple factors as influencing retention, if increases in the dole is such an important factor swaying the "balance of incentives" (1980:39) as he implies, a more consistent pattern across the states would be expected. Karmel needs to explain why the youth of Victoria, Western Australia and the Northern Territory were not enticed away from school in 1973 by increases in the dole, as perhaps were their peers in New South Wales, Queensland, South Australia, and the Australian Capital Territory. He also needs to explain why the youth of Western Australia stayed at school in greater numbers during the very years in which the dole was increased and had maximum real value, and yet why they started to leave school in greater numbers during more recent years when the real value of the dole had dropped.[4] Similarly, he needs to explain why sharper drops in the retention rate occurred in Victoria, South Australia and Tasmania late in the period under study when the real value of the dole had declined, rather than earlier when the real value of the dole was greater. Are youth in some states more avaricious than in others, or better informed or more rational? By looking at the Australia-wide trend only, Karmel does not even show he is aware of the need for these questions to be asked, let alone does he provide answers for them consistent with his implication of a dole influenced decline in male secondary school retention rates. His account thereby loses additional plausibility.

Table 2

APPARENT RETENTION RATES TO COMPLETION OF SECONDARY SCHOOL FOR MALES IN ALL STATES AND TERRITORIES, AND FOR AUSTRALIA AS A WHOLE, 1972 to 1978 (percentages)

State / Year	Australia	NSW	Victoria	Queens-land	South Aust.	West. Aust.	Tasmania	NT	ACT
1972	35.7*	37.8*	33.7	36.3	37.6*	31.8**	24.7	23.7	66.2
1973	35.2	37.3	33.9*	34.0	37.2	32.6	24.6	26.5*	63.6
1974	34.1	35.4	32.8	33.7	34.7	33.8	23.2	25.3	63.5
1975	34.6	35.8	33.3	32.3**	37.6*	33.7	25.3*	16.7**	65.8
1976	34.6	35.7	31.8	35.1	37.4	35.6*	25.0	21.7	61.3**
1977	34.0	35.7	30.6	36.1	34.3	33.3	24.8	18.9	66.0
1978	33.1**	35.0**	28.8**	36.4*	33.3**	32.1	22.9**	16.8	67.0*

* Indicates peak retention for period 1972-1978. In all cases except the peak for the ACT, this coincides with the peak for the longer period 1968-1978. For the ACT the peak for that longer period was 71.5 in 1970.

** Indicates lowest retention for period 1972-1978. In most states and for Australia the lowest retention for the longer period 1968-1978 was in 1968. The exceptions are the NT for which the lowest retention was in 1969 (14.6), and the ACT for which it was in 1976 (61.3).

Source: Commonwealth Department of Education Statistics Unit, 1979.

A further weakness of Karmel's implication that increases in the dole contributed to the decline in the secondary school retention rate for males is that an alternative explanation for that decline is suggested by Karmel's own presentation of statistics concerning new indentureships. These statistics, reproduced in Table 3, seem based on indentures registered after June 30th of one year to that date in the next year (Williams, 1979:644). The number of indentureships has risen considerably during the post-1972 period, and most apparent is the increase of over 10,000 indentureships in 1973-74 compared with the previous twelve month period. This increase preceeded the sharp downturn in male secondary school retention to the final year recorded in August 1974. Furthermore, following a relative drop in new indentureships in 1974-75, a steady increase in new indentureships is noted therefore, coinciding with a period of decline in male retention rates to the final year of secondary school.

Table 3*

NEW INDENTURES REGISTERED AUSTRALIA, 1964-65 to 1977-78

	'000
1964-65	29.8
1965-66	28.9
1966-67	28.0
1967-68	28.2
1968-69	28.3
1969-70	32.1
1970-71	34.7
1971-72	32.6
1972-73	31.9
1973-74	42.4
1974-75	35.5
1975-76	36.3
1976-77	36.0 a
1977-78	42.2

Source: Commonwealth/State Apprenticeship Committee.
*From Karmel (1980:45, Table 2).

a. Both Williams (1979:344) and the Commonwealth/State Apprenticeship Committee (1980:5) give this figure as 39.1.

Despite this tendency towards an inverse relationship between male retention rate trends and new indentureships for the Australia-wide figures, Karmel does not point out this relationship, nor does he discuss the possibility that the availability of new indentureships might have influenced the decline in male secondary school retention rates. Such an influence seems plausible, though, on two grounds. Firstly, as apprenticeships mainly go to young males (Girls, School and Society, 1975:40-41) it is possible that a sudden rise in indentureships might produce a decline in the secondary school retention rate for males, while having little impact on female retention rates. Secondly, Karmel himself notes that there is now more competition for apprenticeships (Karmel, 1980:50). This may mean that some of the more able young males who would ordinarily have stayed on at school now leave to take up apprenticeships, while the less able who would ordinarily have taken up these apprenticeships may still leave school. Increases in the number of indentureships could thus have a double effect on male retention rates by attracting away larger numbers of boys and also by attracting away boys who would have stayed on to the completion of secondary school previously.

To explore the possible influence of new indentureships on male retention rates further, male retention rates to the final year of secondary school and new indentureships (based on figures from the Commonwealth State Apprenticeship Committee, 1980:5-6, 16-17) were examined for the period 1972 to 1978

for each of the six states. Unfortunately, space limitations prevent the presentation of these figures here. From this examination it was apparent that declines in retention do not always coincide with increases in new indentureships. Sometimes no inverse relationship was found and in the case of Queensland for a brief period the trends were directly rather than inversely related. However, inverse relationships were found for New South Wales after 1975 and to some extent earlier in the period studied, for Victoria after 1975, for South Australia both early and late in the period studied and for Tasmania early in the period studied. These trends do not, however, provide a totally convincing case that increases in new indentureships coincided with declines in male retention rates after 1972, and even if inverse relationships had appeared consistently over this period, this still would not have proven that the relationship was causal. Furthermore, for a number of reasons-including fluctuations in new indentureship figures due to changes in administrative procedures (see Commonwealth/State Apprenticeship Committee, 1980:3-6 ; Williams, 1979:376)-caution is required in comparing retention rates and new indentureships at either the Australia-wide or state level. Despite these cautions and the lack of a totally convincing pattern of inverse relationships between male retention rates to the final year of secondary school and new indentureships, the relationships which were observed suggest that further consideration should be given to the possible influence of indentureship availability on male secondary school retention.

To move away from the actual text of Karmel's lecture, other sources might be cited to oppose his implication that increases in the dole contributed to the downturn in the secondary school retention rate for males. Williams (1979:621) specifically raises the possibility that "... increases in unemployment benefits could raise unemployment by inducing some teenagers who might otherwise have been persuaded by their parents to stay at school to join the labour force,...". The conclusion reached on this and related points was that "Whether the changes in unemployment benefits did have a significant effect on registered unemployment is not known" (Williams, 1979:621). However, by noting the willingness of unemployed teenagers to seek work, their reluctance to take the dole and the clustering of youth unemployment among rural and migrant youth who are probably under great pressure to get work, Williams (1979:621-622) seems to imply that there is little support for the notion of dole induced unemployment. By extension, Karmel's implication of a dole induced decline in the school retention rate for males also has little support.

Windschuttle (1979), in his recent book Unemployment, also addresses the issue of whether increases in the dole raised the level of youth unemployment. He claims that the available evidence argues against such an impact and notes two main points to support his case. Firstly, Windschuttle (1979:52) notes that after the dole increase early in 1973, "Unemployment for youth and all age groups declined steadily throughout the remainder of 1973...", and that "It was not until the third quarter of 1974, when the economy moved into recession, that youth and other unemployment began to rise abnormally". Windschuttle points out therefore that "Those who want to argue that increased dole payments caused unemployment, have to explain away nearly two years of *falling* unemployment after the increases were made" (1979:52). Secondly, Windschuttle notes that

> ...if increased dole payments were a factor in unemployment, we should have observed after 1974 a pattern of youth unemployment different to that which prevailed in the past...however, the recent jobless rates have fitted precisely into the pattern that has existed since the mid-1960's when unemployment benefits were considerably lower (1979:52).[5]

While Windschuttle seems concerned mainly with the effect of dole increases on influencing young people to give up work, his arguments apply also to the effect of such increases on male secondary school retention rates. Thus the accounts of both Williams and Windschuttle tend to challenge rather than support Karmel's implication that the decline in the school retention rate for males was in part due to increases in the dole.

Finally, recent research by Bright[6] (see McGregor, 1980:22) into the attitudes of Queensland teenagers to work and the dole also throws doubt on Karmel's implication. Bright found that teenagers are highly motivated to get work, are critical of the unemployed and are wary of being labelled "dole bludgers". Such attitudes do not seem consistent with the image of teenagers conveyed by Karmel's implication that increases in the dole would be enough to entice boys to leave school.

II. Karmel's "balance of incentives" notion, and his assumption that financial return is of most importance to youth

Karmel's notion that youth are influenced in their decisions by the "balance of incentives", and especially by financial return, is a recurring theme in the lecture. Early in his lecture Karmel notes that "Unemployment benefits for 16 and 17 years olds increased sharply in 1973 and 1974 thus altering the balance of incentives..." (1980:39). He follows up this point by noting that

> The decision to leave school is taken in terms of the attractiveness of the various options open to young people; this has changed markedly over the past years, but the changes could easily be offset by government action in respect of financial support (1980:40).

Further on he notes that "Decisions of the young are affected not only by their perception of the value of further education but by the incentives implicit in the various forms of support for the young" (1980:44). Finally, he notes in his concluding discussion that "The pattern of activities of the young is affected by the financial returns (incentives) which different activities offer" (1980:50). The importance of the "balance of incentives" and the relevance of financial return to that balance is clearly a dominant theme within the lecture. This theme is also reflected in Karmel's implication concerning the effect of dole increases on secondary school retention rates for males and in his recommendations concerning how to "rationalise the incentives" (1980:56).

While this notion of the "balance of incentives" swaying the decisions made by youth has some appeal, it has two main weaknesses especially in the way it is applied by Karmel. Firstly, it requires that the decisions of youth are actually made on a rational basis involving the careful weighing up of costs and benefits calculated from adequate information. Such a careful and rational decision-making process based on adequate and up-to-date information does not seem plausible especially for the type of student most likely to leave school before the final year. For such students, decisions may well be made on the basis of whim, the influence of friends or emotional reactions, rather than on the basis of a careful cost-benefit analysis. Furthermore, it seems doubtful whether many teenagers would be aware of how much the dole pays. Lansbury (1978:260) recently found that less than one third of his wide age range sample correctly gave the rate paid to a man with dependents, and a similar lack of knowledge may exist among teenagers concerning youth rates. Research by Musgrave and Wind (1978:172-174), admittedly conducted with a rural sample, found considerable uncertainty among high school students about the starting and eventual wages and hours in the job they expected to enter. Musgrave and Wind (1978:174-175) also found that in the rural town they studied which had a Commonwealth Employment Service office, many

unemployed youth did not even claim the dole. Such findings throw some doubt on whether high school students would know the current dole rate (or other relevant information concerning incentives), let alone use that information as part of a rational decision-making process.

The second main weakness of Karmel's notion of the "balance of incentives" influencing the decisions of youth concerns his emphasis on the importance of financial return to that balance. Even if youth do make rational decisions by some process of cost-benefit analysis, factors other than financial return are likely to be important in that process. Blau, Gustad, Jessor, Parnes and Wilcock (1956:533-536) for example, see occupational choice as resulting from the different valuations a person assigns to the rewards attached to alternative occupations as well as from the expectancy of success assigned to each alternative. This "maximise expected value" (Blau et al. 1956:533) approach to decision-making is merely an advance upon the cost-benefit process model already criticized. However, if one does wish to argue that such cost-benefit models actually represent how youth make decisions, many factors other than financial return should be given attention. It has already been noted that many unemployed youth do not even bother to claim the dole. This indicates their scant regard for financial return, rather than its importance to them. As Windschuttle notes, social science research which shows that general disturbance, boredom and loneliness are frequent ill-effects of unemployment on the young also suggests that factors other than money are important to youth (Windschuttle, 1979:55-60). Similarly, research into how youth view work indicates that it is not only the pay packet they are after: status, being part of the adult world, using skills, and at last actually doing things they see as "real" are also important (Connell, Stroobant, Sinclair, Connell and Rogers, 1975:235-237; Windschuttle, 1979:54; Wright and Headlam, 1976: 20-21, 53-54). Thus Karmel's account seems to place unwarranted emphasis on the incentive value of financial return to youth.

III. Karmel's assumption that higher retention rates in secondary school and higher participation rates in other forms of education are desirable

While Karmel states that "While I would not wish to retain more young people unwillingly in secondary school", (1980:51), he adds that

> it is difficult to argue in favour of a reversal of the long-term trend towards more education for boys. This is particularly so as Australian retention to the completion of secondary school is comparatively low in relation to other advanced countries (1980:51).

He seems to assume in this lecture that increased educational retention and participation rates are desirable, even if the educational component may be somewhat different from traditional schooling. While he wishes to see school programmes made more attractive to young people and also wants more programmes involving varied and non-traditional offerings and combinations of work and study, his approach essentially seems that of wanting to keep youth busy and off the dole.

Karmel provides little real justification for wanting increased educational retention and participation. His justification that Australia lags behind other advanced countries in this regard is hardly an impressive argument. However, he does notethat "... there are benefits from a better educated population both in terms of the sophistication of our society and the personal satisfactions to be obtained from wider cultural horizons" (1980:51). But while this justification is in some ways commendable, it downplays problems associated with increased retention and participation recognised by others. For example, Coleman (1974:127-135) discusses various advantages and disadvantages of the "segregation of

youth" which has arisen because of extended schooling in the U.S.A. On a different tack, Ford, quoted in Williams, warns that

> holding people longer in the education systems will not resolve the youth unemployment problem and almost certainly will have detrimental effects on the education system (Williams, 1979:87).

Finally, Berg (1973:188) suggests that both personal and political problems may result when the aspirations of an educated citizenry are thwarted. This suggestion is not cited here to endorse a policy of "keep them ignorant and happy", but rather to stress the possible problems associated with increased educational participation in circumstances of reduced opportunity for fulfilment through traditional work roles. It would seem likely that such problems would be greatest in a society which continues to promote the "work ethic", and such propagation is what Karmel desires. In warning against education for unemployment, he states

> It is certainly important to teach young people about the realities of work and the labour market, and how to operate in a world in which people will have to change jobs from time to time and perhaps suffer some periods of unemployment. However, the notions that unemployment is a norm, that work has to be spread around and that technology is to be resisted and productivity kept down are not only defeatist in spirit but are destructive of a society which can afford to consider these options only because of a high level of production stemming from past technological progress and attitudes to work (1980:59).

IV. Karmel's notion of "youth unemployment" and his treatment of youth unemployment trends generally

Karmel's notion of "youth unemployment" seems influenced by the same values underlying his desire to see increased educational retention and participation. That these underlying values correspond very much to the traditional "work ethic" is implied when he notes that

> If relatively fewer young people are to be in full-time employment and if unemployment is to be regarded as an unacceptable option for the young, a spectrum of activities must be developed ... (1980:53).

For Karmel, it seems, activity is good and what is bad about being on the dole and not at school is that it does not necessitate activity. To discourage youth from such undesirable inactivity Karmel suggests that "Unemployment benefits would be available only as a last resort" (1980:56) in his rational plan of funding. It is not disputed here that inactivity and other concomitants of unemployment do have adverse effects on youth. However, the desirability of enticing or virtually coercing (as seems implied in Karmel's suggestion that the dole become the last resort) youth into activity programmes is queried. For such an approach to be desirable the positive aspect of providing activities for youth would have to outweigh the negative aspects which include its manipulativeness, the possible ill-effects of treating youth as a special group and in the case of programmes of an educational bent, the previously noted problems which may arise from increased educational participation.

What also comes through in the lecture is that if one accepts Karmel's notion of "youth unemployment", if his recommendations were implemented and if they worked, the problem of youth unemployment would indeed be eliminated. This simply means that youth for whom jobs were not available would have been enticed or coerced into some alternative activity, and hence no "youth unemployment" in Karmel's terms would exist. Of course, if one considers that there is a problem of youth unemployment whenever young people who would really like to have jobs can not get them, then no matter how well Professor Karmel's recommendations worked, one would still consider that a youth unemployment problem existed.

Karmel recognises that his recommendations will not actually provide jobs for people who want them. Hence in his concluding paragraph he writes

> It is sometimes argued that there is little point in developing a policy for youth so long as there is significant general unemployment. Why go to the trouble of teaching people skills if at the end of their training they are unable to obtain jobs? This attitude ignores the fact that the purpose of a comprehensive youth policy is to provide satisfying activities for young people up to the age of 20 and to ensure that they are better equipped to compete in the labour market. Such a policy is important irrespective of the level of unemployment. It has merit in itself, although the stimulus for it undoubtedly has been the high levels of youth unemployment recently experienced. Certainly it does not relieve governments of the responsibility for maintaining high and rising levels of employment. However, unless a policy is developed to provide satisfying activities for the young and an easier entree to the world of work and adult responsibility, divisions will develop in our society which, in the longer run, may become insupportable. (1980:60)

While much in this paragraph is commendable, Karmel downplays the problem of what happens to the youth who take part in his recommended programmes after they turn 20. Even if they are "better equipped to compete in the labour market", will this help them if the jobs are still not there to be won? May not the problem of "youth unemployment" involving 15 to 19 year olds then become one of "early adult unemployment" involving those in their early 20's? Also rather than a youth policy along the lines Karmel suggests being able to circumvent social divisiveness, at best it might delay the formation of such divisions for a few years, and at worst it might add to divisiveness by treating 15 to 19 year olds as a special group on which special constraints are placed.

Finally, some brief comments concerning Karmel's treatment of youth unemployment trends are offered. Karmel states that "Overall unemployment began to become serious in 1975, although youth unemployment had begun to increase relative to unemployment among adults from 1972 onwards" (1980:46-47).[7] This leads him to look for new factors (Karmel, 1980:46-48) influencing youth unemployment, a search not required if high youth unemployment is seen merely as reflecting high general unemployment (see Windschuttle, 1979:45-46). Yet, as already noted, Windschuttle (1979:45, 52) claims that there has been little change in the pattern of youth unemployment since the mid-1960's. Furthermore, Williams (1979:85) writing of the period 1974-1977 notes that "Little of the recent dramatic increase in youth unemployment was due to a rise in the youth unemployment percentage relative to the overall unemployment percentage", and then proceeds to exonerate education from major blame for youth unemployment because of this fact.[8]

The claims by Windschuttle and Williams, however, are based on examination of youth to overall unemployment ratios or rates, and in the case of Windschuttle also on examination of the youth "share" of overall unemployment. As the share approach has been criticized by Sheehan (1977:H4) because "... the shares can be affected by variation in the shares of the relative labour forces", and as the large segment of overall unemployment which youth make up may contribute to the ratios of youth to overall unemployment appearing relatively stable, Karmel's approach of comparing youth unemployment with adult unemployment may be the more meaningful. Williams (1979:614) however, also studied youth to adult unemployment ratios. While implying some increase in youth unemployment relative to adult unemployment,[9] Williams noted fluctuations in the relevant ratios seemingly from 1964 to 1974, followed by a considerable rise in youth unemployment "... by 1975 to over five times the mature adult rate" (1979:614).

The ratios of unemployment among 15-19 year olds to unemployment among adults and to overall unemployment are presented in Table 4 for the period 1964 to 1979. These figures suggest that the ratios of youth to overall unemployment have been fairly stable over this period, with the exception of the slight rise for 1976-1977. The ratios of youth to adult unemployment follow the pattern described above

by Williams, showing early fluctuations from 1964 to 1974 and then a substantial rise in 1976 peaking to 5.1 in 1977. Thus while Karmel's statement concerning the increase in youth unemployment relative to adult unemployment after 1972 is essentially correct, more discussion by him of his selection of the youth to adult ratios as the basis for his statement, of the timing of the more noticeable increases observed when using these ratios and of alternative measures which have lead others to write of the relative stability of youth unemployment would seem to have been warranted.

Table 4

RATIOS* OF UNEMPLOYMENT AMONG 15-19 YEAR OLDS TO OVERALL UNEMPLOYMENT AND TO UNEMPLOYMENT AMONG 25 YEAR OLDS AND OVER, 1964 TO 1979

Ratio \ Year (May)	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
15-19:overall	2.4	2.3	2.1	2.4	2.3	2.1	2.3	2.2	2.3	2.6	2.6	2.6	3.0	3.0	2.6	2.7
15-19:25 and over	3.4	3.1	3.0	3.5	3.7	3.0	3.0	3.0	3.3	3.9	3.8	4.0	4.8	5.1	3.9	4.6

*Ratios calculated from percentages given by Karmel (1980:47, Table 8).

Conclusion

Much of the discussion in this paper has been critical of aspects of Karmel's Radford Memorial Lecture on "Youth, Education and Employment". It should be re-stated at this point that the lecture presents valuable information concerning relevant trends, raises many points for discussion, emphasises the need for a comprehensive youth policy and offers recommendations for incorporation in such a policy. Karmel has thus attempted to offer some constructive recommendations concerning very difficult social problems, which is not an easy task. However, with respect to the four aspects discussed in the present paper, Karmel's account seems deficient in fairly significant ways.

In conclusion, more general comments relevant to policy oriented papers or addresses may be made. Based on the example offered by Karmel's lecture it is suggested that in such policy oriented work attention may need to be paid to three points. Firstly, when demographic statistics form much of the basis for policy recommendations it would seem necessary to examine and probe such demographic trends carefully. It may also be necessary to go beyond Australia-wide statistics and examine regional trends. Furthermore it is necessary to explore alternative explanations which may be suggested by other available demographic trends. Inferences based on demographic trends must be treated as such, and care must be taken not to assume that what is inferred has been proven. Secondly, as part of this cautious use of demographic statistics, other accounts and social science research findings should be utilized to test the plausibility of inferences and to suggest or eliminate alternative explanations. Thirdly, underlying value assumptions should be clearly stated. For policy recommendations to be developed underlying value positions must be taken, and clarification of such positions may help others better evaluate the recommendations made.

Notes

1. Appreciation is expressed to Dr. R.B. King for making several points and suggestions which have been incorporated in this paper. Thanks are also due to Professor Peter Karmel and Dr. I. Birch for their useful reactions to earlier forms of this paper. A somewhat fuller version of this paper is soon to appear in the journal Education Research and Perspectives.

2. Figures from the Australian Bureau of Statistics publication Schools (1974) suggest that the total final year enrolment in 1974 was 77,628. As this is 32.8% (see Table 1) of the initial intake cohort, that intake cohort would presumably have been 236,670 of which slightly more than half (say 120,000) would be males. Hence if 34.1% of these males were enrolled in final year in 1974 (the retention rate for males for 1974 from Table 1) this would constitute 40,920 enrolled males. Had the retention rate not dropped by 1.1% from the 1973 level but had remained at 35.2%, the number of males so enrolled would have risen to 42,240, a rise of 1,320. Had the retention rate stayed at the 1972 level of 35.7%, the number of males enrolled in final year in 1974 would have risen to 42,840, an increase over the actual number of 1,920.

3. The apparent retention rates reported by the Commonwealth Department of Education Statistics Unit (1979) are presumably based on figures in the Australian Bureau of Statistics yearly publication Schools for the relevant years. As the ABS bases its figures on the school census as of August each year (at least as stated in the issues for 1973 through to 1977), the 1973 retention rate based on August enrolments could reasonably have been expected to reflect a reaction to increases in the dole in March 1973 of the type Karmel implies.

4. Karmel makes specific reference to these changes in the real value of the dole when he notes that "... unemployment benefits for young people increased significantly in real terms in 1973 and 1974, although their real value has been eroded more recently" (Karmel, 1980:44).

5. Here the two sources cited by Windschuttle are Sheehan (1977) and the Australian Bulletin of Labour (1977). Sheehan (1977:H3-H5) notes that both the "share" of youth in total unemployment and the ratio of youth to total unemployment have been stable since the mid-1960's. The Australian Bulletin of Labour (1977:5) notes that the youth share of total unemployment has remained stable but that "... juvenile unemployment *rates* have increased somewhat relatively to adult rates - but..., most of this increase has occurred since 1972" (1977:6), a finding which Windschuttle seems to ignore when he writes of "... the general consistency of the ratio between youth and adult unemployment" (1979: 45-46). Later pages of the present paper discuss the use of youth to overall unemployment ratios as opposed to the use of youth to adult unemployment ratios.

6. The author has not had the opportunity to examine the research by Bright in detail. The findings noted here come from a brief report in The National Times (1980, March 30th to April 5th:22).

7. Professor Karmel did note elsewhere in his lecture however, that for 15 to 19 year olds "... the decline of full-time job opportunities, which appears to have been especially serious since 1975, is a continuation of a long term trend" (1980:44-45).

8. Williams elsewhere seems to go back on this statement somewhat. He notes for example, that

> There are some indications from the Census of Housing and Population 1954 to 1971 that over the longer period the increase in the ratio of youth unemployment was rather more than the increase shown in the survey data from 1965 to 1978 (Williams, 1979:85).

He picks up this point again when he notes that "... there were signs over a longer period of a relative increase in the ratio of youth to overall unemployment" (1979:613). In contrast though, he seems sufficiently convinced that youth unemployment has been relatively stable to comment in his introductory letter to the Prime Minister that "The percentage unemployment among teenagers has not risen significantly relative to general unemployment during the recession" (1979:V).

9. In fact, just preceeding this section, Williams writes of "One important reason why the unemployment of teenagers rises more than the unemployment of older workers..." (1979:612), which seems to assume an increase in youth unemployment relative to that among adults.

References

Australian Bulletin of Labour, December, 1977.

Australian Bureau of Statistics, Schools. Issues for 1971 to 1977.

Berg, I. Education and Jobs: the great training robbery. Moddlesex, England: Penguin Books, 1973.

Blau, P.M., Gustad, J.W., Jessor, R., Parnes, H.S. and Wilcock, R.C., "Occupational choice: A conceptual framework". Industrial and Labour Relations Review. 1956, 9, 531-543.

Carrick, J.L. Report of the Committee of Inquiry into Education and Training. Statement by the Minister for Education, Senator the Honourable J.L. Carrick, 22nd November, 1979.

Carrick, J.L. and Viner, I. A Comprehensive Policy for Transition from School to Work. Statement by the Minister for Education Senator the Honourable J.L. Carrick and the Minister for Employment and Youth Affairs the Hon. Ian Viner, 22nd November 1979.

Coleman, J.S. (Chairman) Youth: Transition to Adulthood, Report of the Panel on Youth of the President's Science Advisory Committee. Chicago: The University of Chicago Press, 1974.

Connell, W.F., Stroobant, R.E., Sinclair, K.E., Connell, R.W. and Rogers, K.W. 12 to 20: Studies of City Youth. Sydney: Hicks, Smith and Sons Pty. Ltd., 1975.

Commonwealth Department of Education Statistics Unit. Apparent Grade Retention Rates and Age Participation Rates. Statistical Monograph No. 3, Third Edition, May, 1979.

Commonwealth/State Apprenticeship Committee Apprenticeship Statistics 1969/70 - 1978/79. Prepared by the Department of Employment and Youth Affairs, Canberra: Australian Government Publishing Service, 1980.

Henderson, R.F. (ed) Youth Unemployment: Proceedings of the Second Academy Symposium, Academy of Social Sciences in Australia, 1977.

Karmel, P. "Youth, education and employment" Radford Memorial Lecture. Australian Educational Researcher, Vol. 7, No. 1, March 1980, 35-60.

Lansbury, R. "Unemployment and social class. The end of embourgeoisement". The Australian and New Zealand Journal of Sociology, 1978, 14, 3(1). 259-265.

McGregor, A. "School-leavers in fear of 'dole-bludger' stigma". The National Times, March 30 to April 5, 1980:22.

Musgrave, P.W. and Wind, E. School and neighbourhood in two rural towns. In School, Community and Work: Urban and Rural Aspects. Commission of Inquiry into Poverty, Poverty and Education Series, Canberra: Australian Government Publishing Service, 1978.

Report by a Study Group to the Schools Commission, Girls, School and Society, Canberra: Schools Commission, 1975.

Sheehan, P. "Economic aspects of youth unemployment", in R.F. Henderson (ed) Youth Unemployment: Proceedings of the Second Academy Symposium Academy of the Social Sciences in Australia, 1977, H1-H22.

Williams, B.R. (Chairman) Education, Training and Employment. Report of the Committee of Inquiry into Education and Training, Canberra: Australian Government Publishing Service, Vol. 1, February, 1979.

Windschuttle, K. Unemployment. Ringwood, Victoria: Penguin Books, 1979.

Wright, A. and Headlam, F. Youth Needs and Public Policies. Melbourne, Australian Council for Educational Research, 1976.

INVESTIGATION OF THE 1978-79 LINK COURSE PROGRAMME IN SOUTH AUSTRALIA

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This paper describes an investigation conducted during 1978-79 into the Link Course Programme in South Australia. The major purpose of the exercise was to examine the conduct and effectiveness of the Programme. A number of recommendations arose from the study and these were used by an inter-Departmental group to develop interim policy.

CONTEXT

Career education courses in South Australia were until recently few in number and limited in scope. Job opportunities for school leavers were in plentiful supply and career education was not viewed as a pressing need by either parents, employers or students. The annual 'Careers Night' along with incidental comment from teachers and parents was regarded as sufficient for most students.

Times have changed as career opportunities for school leavers have diminished to the point where there is now a general shortage rather than an oversupply. Teachers in particular have come to recognize the advantages of school leavers having a range of skills and knowledge related to the work environment. Career courses were seen as one means of achieving this end. As other types of programmes were created and implemented, the present programme of transition education was born. Both the Department of Further Education, which is responsible for technical and further education (TAFE) provision in South Australia, and the Education Department (responsible for primary and secondary education programmes) contributed to the expansion of effort. Most of these initiatives were developed by each Department operating separately, but others were jointly planned and implemented.

The link course segment of the transition education programme is of special importance, because both Departments have a responsibility to co-operate closely at state and local level. For instance, secondary school teachers were expected to liaise with their counterparts in Department of Further Education (DFE) colleges to ensure the delivery of link courses to secondary students. Nevertheless, soon after the introduction of these courses it became apparent that there were serious difficulties. Planning of courses was carried out by some colleges of further education with little or no reference to the schools. Except for isolated instances of efficiently run programmes (e.g. in the South East of South Australia), problems in regard to co-operation were not being resolved. Again, philosophical differences within and between the two Departments were many and varied.

PURPOSE OF THE STUDY

It was therefore decided to initiate an examination of link courses in order to ascertain the degree and effectiveness of co-operation and to identify problem areas. Action could then be taken to plan and implement an effective programme across the State using the guidelines developed from the survey

findings. Approximately three months was allowed for the completion of the project exercise to the point where there would be information suitable for planning and designing a revised link course programme. After the required changes had been implemented, a formal report could be prepared for public distribution.

TRANSITION EDUCATION IN SOUTH AUSTRALIA

Although this project is not directly concerned with all aspects of transition education, a brief outline of the total programme in South Australia will supply sufficient context for this paper. Both the Department of Further Education and the Education Department provide transition education programmes. DFE supplies foundation and pre-vocational courses, while the Education Department provides programmes within its own transition education programme framework. The Departments cooperate to provide link courses.

Transition education in South Australia can be divided into five types of programmes:

- . Career Education,
- . Work Experience,
- . Link Course,
- . Pre-Vocational, and
- . Foundation Course.

Secondary school students begin with an introduction to career education, and can then take part in the Work Experience Programme after which they can proceed with link course studies. The Education Department liaises with the Department of Further Education concerning provision of link courses.

The last two programmes are administered by the Department of Further Education. These are available to school leavers who have yet to obtain a job.

DEVELOPMENT OF LINK COURSES IN SOUTH AUSTRALIA

Link courses first commenced in South Australia during 1975. Their development, however, was due mainly to local initiatives begun within colleges of further education and nearby secondary schools.

In 1976 a Working Group, consisting of senior education officers of both the Education Department and the Department of Further Education, was established to advise on ways in which curriculum cooperation between the two Departments could be achieved. This group invited people from both Departments to contribute ideas concerning: link courses, the sharing of resources, and alternative Year 11 and Year 12 programmes.

In 1977, the Working Group recommended the development of link courses throughout South Australia for secondary students. It also recommended joint curriculum planning between staff of secondary schools and colleges of further education.

During 1979, 2 100 secondary students from over 100 government and independent secondary schools were attending link courses at 20 colleges of further education. Most of the 60 different link courses

were of the career awareness type, catering for Years 10, 11 and 12 students. This represented a more than two-fold increase on 1978 enrolment figures.

LINK COURSES AS PART OF THE TOTAL EDUCATIONAL PROGRAMME

It is envisaged that link courses should be seen as part of the general educational curriculum. They should also complement the remaining elements of the transition education programme. The courses must also facilitate the development of strong links between the school curriculum and the wider community. This would enable students to gain an appreciation of the world of work thereby broadening their educational experience beyond school boundaries.

Expressed needs of students other than those that are exclusively job related must also be considered when developing a curriculum. Evans (1971) stated that "... a school curriculum and educational goals that ... mirror .... the occupational structure create merely a platform and impetus for launching youth into the world of work." (p.23) Students must receive guidance and instruction to ease them into employment but this cannot be done through a curriculum which is totally devoted to job related training.

Several benefits have been ascribed to link course programmes. Link courses can offer the advantage of enabling students to become aware of how their schooling can be useful by relating the benefits of subjects already studied to future employment possibilities. Increased awareness provides a stimulus for students to apply themselves more diligently to study and thus achieve a chosen goal. Participation in link courses can make the last year of school more meaningful to students and may encourage them to be more critical of their performances. Such experience may encourage participants to value more highly the importance of learning at school. Increased relevance of school studies to the work situation along with some skills acquisition could minimize the problems of students in the transition from school to work.

Link courses can also provide greater insight into the world of work. Such courses may enable students to become faimilar with the requirements of a broad range of occupations and, as a result of this broader understanding, increase their prospects of obtaining a satisfying career. This knowledge, together with realistic job aspirations, may be helpful in reducing the time wasted by some school leavers in changing from job to job until a satisfactory placement is found.

An increased capacity to make informed job choices might result in school leavers remaining longer in those areas of employment requiring extensive training. Hocking (1978) states that "... there is a high loss rate in apprenticeships which is a disadvantage to employers as well as employees. The reason for this loss rate could be lack of information in choosing a job." Such wastage could possibly be reduced by an adequate link course programme.

REASONS FOR ESTABLISHING LINK COURSES IN SOUTH AUSTRALIA

Two major factors influenced the decision to establish link courses in South Australia:

. Established specialist facilities suitable for the teaching of link programmes were

available within DFE Colleges.

. The Department has a legitimate brief to become active in this area as DFE link courses should be offered outside of the immediate school environment.

Two other features were considered as important and relevant to the establishment of link courses for secondary students. In the first place, the Department of Further Education college environment is sufficiently different from the secondary school situation for students to gain new perspectives about vocational education. Secondly, as the Department of Further Education staff are not directly connected with secondary schools, their philosophy and approach is quite differnet to that of their secondary counterparts. Students would benefit from this other point of view.

Three methods of delivering link courses were developed and these were designed in such a way as to take advantage of the above factors while at the same time providing a broad vocational experience.

. Discrete subjects each with a vocational emphasis were studied within a high school, but with DFE staff teaching the students.
. Information about occupational training conducted by the Department of Further Education was fed into secondary school career education programmes.
. Year 10, 11 or 12 students spent half to one day per week over a period of several weeks within a college of further education being introduced to broad vocational areas of study.

DEFINITION OF LINK COURSE

As link courses became more widespread certain practices developed which were consistent with the conditions mentioned above. It became apparent that link courses were intended to provide a broad vocational experience along the following lines. They can:

. broaden the foundation of a sound general education by including preparation for employment, coping with unemployment, and creative use of leisure,
. provide students with more awareness of the world of work,
. contribute to a sound career education programme and equip secondary students with the knowledge and skills to choose a career wisely,
. expand educational choice by widening the options for further study,
. enable students to experience alternative teaching methods and to study in a more adult environment,
. help students gain some knowledge, skills, attitudes and values which are useful personally and which may be of some advantage in the labour market,
. help students understand that their other school work is relevant and has application to their vocational interests.

Because students had their awareness of the job situation increased, these courses were called awareness link courses. Introduction to a succession of such experiences over a period of say one year

lead to the adoption of the name 'taster' link course. It is these taster link courses that are now described for the purpose of this study:

Taster link courses are taken by secondary school students who are usually in their last year at school. These people spend half to one day per week for several weeks being introduced to a broad vocational area. This process is repeated for two, three or more vocational areas over a period of one year.

NEED FOR A REVIEW

An investigation of the taster link course programme was considered appropriate for the following reasons:

- Although certain areas of the State had achieved some consensus in regard to programme aims and objectives, other areas differed markedly from this situation. This had led to a variety of course aims across the State. Courses ranged from those oriented toward a specific vocation to those providing secondary school students with an understanding of a wide range of vocations.
- There was a need to compare the accepted Departmental aims with those of current courses.
- There was considerable variation in the form and extent of integration taking place between schools and colleges of further education.
- There was a shortage of courses aimed at assisting students who were undecided about which vocation to pursue.
- There was considerable variation in the degree to which the college programmes and the general educational school curriculum (e.g. mathematics, history) were integrated.
- Very little information was given to students prior to enrolment in a link course.

AIMS OF THE STUDY

This study sought to ascertain the degrees of understanding of course aims as perceived by secondary students, college lecturers and secondary teachers; and to identify the perceived benefits accruing to students as a result of participating in link courses. Comparison between the various groups would indicate the level of agreement across all respondent groups. A high level of agreement would demonstrate that there was a high degree of consensus regarding the objectives and, students were gaining widely recognised benefits.

Schools and colleges were expected to plan courses using a joint approach. This would satisfy both college and school requirements. The review also sought to obtain data regarding the extent of joint planning activity. Required changes of direction could then be inferred from the data, and the necessary corrective action could be taken.

Finally, it was intended to develop guidelines to assist in effective monitoring of the

programme. It was considered important that future programmes incorporate suitable quality control mechanisms so that satisfactory standards of provision could be maintained. The major instrument for ensuring adequate quality control would be a set of guidelines relating to policy and practice across the State. Operations of schools and colleges should then be consistent with these guidelines. Formal reporting could be effected once changes had been implemented and a modified programme stabilised. A document suitable for public distribution could then be prepared. It would not only report the investigation exercise, including the findings arising from it, but give an account of action taken indicating the use to which the findings had been put.

SPECIFIC AIMS

The study concentrated primarily on assessing the following student related matters:

- . the aims and objectives of the courses as perceived by secondary students,
- . the degree to which students felt their general educational subjects would be useful to them in their future jobs,
- . the reasons why students became involved in the courses,
- . whether students were increasing their knowledge of vocational courses, either toward a specific career and/or toward useful leisure activities.

Information would also be sought from lecturer and teacher groups in regard to:

- . lecturer and teacher perceptions of the aims and objectives of link courses,
- . the degree of cooperation between administration and teaching staff of secondary schools and DFE colleges with respect to planning, implementing and evaluating courses,
- . the degree of integration of link courses into the secondary school curriculum.

A period of slightly more than three months was allowed for the investigation. Scheduling of the project into such a short time span meant that research and management methodologies had to be adjusted accordingly. Even so, it was considered that the findings would adequately answer the questions asked. Furthermore, delivery of information would occur within the deadline set for the project. Decision makers would then be able to use the information provided within a relatively short period after commencement of the project.

SURVEY INSTRUMENTS - SELECTION AND DESIGN

Consideration was given to two methods of collecting data from respondents. One approach would be to conduct structured interviews with the researcher asking questions and each respondent answering them. Another approach would be to visit colleges and schools, hand out a questionnaire to each respondent and then allow each person to complete the questionnaire by writing the answers in the appropriate spaces. The second approach was adopted as the appropriate survey instruments as they offered the most efficient means of gathering information in the short time available for data collection. The specific aims were used to guide the preparation of draft questions.

The data sought by the study was such that a general understanding of the operation of link

course programmes would result. It was felt that further surveys would be necessary in order to obtain specific details of the planning operation as well of perceived benefits. Thus open ended questions were constructed for the purpose of eliciting general information. It was anticipated that future surveys would use a higher proportion of closed questions so as to extract information at a level of detail necessary for action of a more specific nature than intended for this study.

Piloting of the draft questionnaires on two sets of respondents randomly selected from all link courses resulted in changes to some of the questions. A number of minor changes resulted from the follow-up trial run during which time the procedures for administering the survey were tried out under actual working conditions.

SELECTION OF RESPONDENT GROUPS

Selection of Colleges

Colleges were selected to be surveyed on the following grounds:

. their relatively high involvement in link courses, and

. the diversity in the types of link courses being conducted.

Selection of courses

Except for one college a minimum of two courses was surveyed for each college of further education. All told, fifteen types of courses were considered. This represented over 80% of all course types operating in South Australia during 1978.

Most of these courses were repeated once every 5-6 weeks during the year. It was considered that the nature of a given course did not change markedly over the year, and therefore each class surveyed was considered to be similar to all other classes within a given college course.

Secondary schools selected

The secondary schools visited were all those which had students enrolled in the link courses surveyed.

Participants selected

At the time of the survey 150 students were participating in the link course classes. Of these, 132 participants responded to the questionnaire. (The remainder were absent on the actual day of the survey). Close to 1 000 students participated in the link courses conducted by all colleges during the 1978 year. In terms of how the responses of the 132 participatns collectively relate to the 1 000 students, it can be calculated that there is $\pm$ 8% 'error factor'[1] when the responses of the 132 participants are applied to all 1 000 students. The findings are considered adequate for making curriculum decisions.

(1) Based on a 95% confidence interval, those percentage responses arising from the sample and falling within the range 20%-80% can be applied to the 1978 student population in the following way. The sample percentage response is subject to $\pm$ 8% variation when applied to the student population on the basis that the sample is a random one. The calculations are based on the statistical treatment described in Snedecor, G.W. and Cochran, W.G. Statistical Methods, Sixth edition Iowa: The Iowa State University Press, 1971, page 516.

Lecturers selected

All lecturers involved in teaching the 132 participants were interviewed. Since most of these lecturers were involved in link course classes throughout the year, their responses adequately represented all teachers involved in these particular link courses.

Teachers selected

Seventeen secondary schools had students attending the various courses surveyed. All 17 teachers who administered the link courses within these schools completed a questionnaire. All of these teachers were also involved in other link course classes run during 1978.

SURVEY PROCEDURE

The survey procedure involved contacting the colleges and arranging times to visit students and staff. Upon meeting respondents, the researcher gave a short explanation concerning the aims of the survey and what was hoped to be achieved upon its completion. Participants were informed of the confidentiality of the questionnaire with access to data being limited to the project team. It was also mentioned that comments would be collated to form group data.

The researcher was present throughout the administration of the questionnaires. Participants were asked to complete the questionnaire at their own pace and to direct any queries to the researcher. (The pilot and trial runs had previously indicated that queries would be concerned with the level of detail required to answer particular questions). While students completed their questionnaires, the particular DFE lecturer was invited to fill-in the questionnaire designed for lecturing staff. A short discussion followed the completion of questionnaires, and participants were offered the opportunity to comment on the programme. Finally, participants were thanked for their contribution.

Similar procedures were involved in surveying those secondary teachers responsible for organising the link course programmes from within their schools.

RESULTS OF THE SURVEY

Student responses

The following summary arises from the responses given by the sample of 132 link course students.

Close to 35% of all respondent students enrolled in link courses in order to learn about a particular occupation. Most participants (59%) felt that the programmes heightened their employability, thereby improving their chances of gaining a job.

Little guidance was given to participants (21% of all respondents) before joining a course. Most joined because they felt it was a 'good course'. The minimal guidance that was given did little to assist students in selecting appropriate courses. A few did not wish to enrol in other courses because a career decision had already been made.

A large majority of students (73%) considered that they had learnt work-related skills, especially in one particular occupation. Others felt that their involvement had opened up wider opportunities for employment.

Most respondents (59%) considered that link courses were not relevant to the subjects at the school. Little integration occurred between course and subject content.

Most (75%) attended a course for a half day per week. This allowed greater opportunity for them to become involved in other courses.

Lecturer respondents

The following remarks were derived from the responses of DFE lecturers responsible for conducting the link courses surveyed.

The majority of link courses were seen to be initiated by a particular college of further education. Even so, secondary schools promoted and initiated link courses in subject areas which could not be provided by DFE colleges because of a lack of resources.

Liaison between secondary schools and colleges of further education was minimal. South East Community College was an outstanding exception. Representatives from this DFE College and the nearby schools met regularly in order to plan and monitor the link courses served by the College. This meant that the courses provided in this planning environment were effective and were directed toward meeting student needs.

Lack of cooperation was mentioned by many lecturers. Courses were planned largely by colleges acting in isolation. Only then were schools approached. Formal contact between the institutions was inadequate, while informal contact was limited to either visits by teachers to a course, or to joint staff meetings designed to make a quick assessment of the effectiveness of a particular course. It was not suggested by lecturers that these informal meetings were an opportunity for teachers to initiate planning strategies.

Teaching of work related skills, and learning about a particular occupation were considered to be aims of the courses. Each course was seen as a separate entity and it was felt that this tended to 'lock' some students into pursuing a career for which they were unsuited or for which there were few employment opportunities.

It was considered that there were large variations in the quality and quantity of information received by students. The information was often oral and, on the occasions when written information was made available, it was often received after students had made a commitment.

Teacher respondents

The following statements summarise the views of those secondary teachers who were directly

involved with the provision of the link courses surveyed in this study.

Most of the secondary school teachers became aware of link courses after a college of further education had approached the school. In general, colleges had developed courses before they made an approach. When schools wanted a particular subject taught (e.g. Business English, Home Science) they approached a DFE college and asked for this to be taught in a link course setting. In these cases, the courses were jointly planned and developed.

It was felt that the students most benefit because of an increase in their marketable job skills. Knowledge of occupational requirements widened their areas of search for employment. In addition, specialising in one of these occupations gave students an edge over other job applicants who had no previous experience.

It was considered that there was poor contact between the staff of the two types of institutions. Both formal and informal contact was welcomed by the teachers.

The secondary teachers considered it their responsibility to teach the theoretical aspects of subjects with college lecturers being involved in demonstrating the practical applications of the theory learnt. The teaching roles were seen as quite distinct with the DFE college staff being seen as having total responsibility for teaching link course students; the theoretical component was part of the normal secondary school curriculum.

The information received by students about link courses was considered to be of poor quality. The information often reached students after they had commenced studies. The exception to this was when a link course completely replaced a recognised school subject.

FIGURE 1: SUMMARY OF REACTIONS OF STUDENTS, LECTURERS AND TEACHERS TO SURVEY QUESTIONS

MATTERS OF CONCERN	STUDENT COMMENT	LECTURER COMMENT	TEACHER COMMENT
Reasons for involvement in the course.	Students participated in link courses from a desire to test out one career choice.	Many lecturers thought that students wished to develop an extensive understanding of a particular occupation while some felt that students wished to develop their wider career choice.	Students attended link courses because they learnt work-related skills in one or several occupations. This increased their job opportunities.
Guidance received before attending a link course.	Perfunctory guidance was given to students concerning link courses. Judging from the student's comments, it appears that the courses would provide more benefit if satisfactory guidance was given to participants.	The students did not receive adequate information about link courses before making the decision to participate in a course.	Most students were inadequately prepared for making decisions concerning link courses. This situation generally led to students making a one career choice and testing out this choice only.

Knowledge and skills gained from the link course.	Students gained knowledge and work skills. This enhanced their opportunities for employment in a particular occupation.	Most lecturers felt that students learnt about a particular occupation. Some lecturers felt that this considerably narrowed career choice and employment prospects.	Students were learning work-related skills. Although this increased job opportunities, only one occupational area was being explored.
Involvement in further link courses.	Students were overwhelmingly in favour of attending further link courses.	-	-
Planning of link courses.	-	Link courses were planned with minimal involvement from schools.	Schools did not have an opportunity to participate in the planning of link courses.
Aims and Objectives of the Courses.	-	Each course was designed to enable students to develop work-related skills for a particular occupational area.	The courses aimed at teaching work-related skills across a number of occupations which broadened the career choices available to participants.
Co-ordination involving college and secondary school staff.		Secondary teachers were not involved in formal co-ordination activity. Contact was limited to formal discussions.	The courses were generally operated by the colleges without input from the schools. Informal contact occurred on a superficial level.

AREAS OF CONSENSUS AND RECOMMENDATIONS

Areas of agreement between the various parties are reported below, along with suggestions about the action necessary to achieve the required ends. These statements together with recommendations were considered and confirmed by an inter-Departmental advisory group.

1. Reasons for involvement in the course

All parties agreed that students participate in link courses because of a desire to test out at least one career choice. There is a disagreement as to the extent and depth of this career choice experience. Student perceptions tend to be more limited than those of teachers and lecturers.

The above situation is understandable, but it is considered that teachers and lecturers could provide a wider perspective by:

- encouraging students to 'taste' a range of link courses,
- helping students acquire a reasonable appreciation of all the occupational areas involved,
- helping students develop wider career choices, and
- assisting students to develop work-related skills.

It was RECOMMENDED that students be counselled to 'taste' a range of link courses.

2. Guidance received before attending a link course

All parties agreed that guidance was inadequate and students tended to take 'pot luck' when selecting a course, the following remedial action is considered appropriate:

(a) lecturers and teachers to jointly plan and develop guidance materials

(b) adequate information to be given to students prior to attending a link course

(c) students to be counselled prior to making a choice so that they become involved in a range of link courses in the occupational areas suited to their aspirations and aptitudes.

It was RECOMMENDED that a comprehensive student guidance and counselling programme be planned and developed with secondary teachers being largely responsible for the delivery of the guidance programme. These people should receive instruction on how to counsel students on matters of aptitude, interest and occupational relevance.

3. Knowledge and skills gained from the link courses

All groups agreed that students gained work related skills. Lecturers and teachers felt that students were severly limited by being restricted to one link course experience. Career choice was thus narrowed to one occupational area.

It would be desirable for students to gain knowledge and skills in a number of related link courses over a period of say one year. Any link course programme should have the capacity to cater for the needs of a minimum number of students.

It was RECOMMENDED that link course programmes should be designed to cater for the wide ranging needs of the minimum number of students required to fill all link courses offered during one academic year within a particular region.

4. Involvement in further link courses

Students were in favour of attending further link courses. Thus students can be assumed to have sufficient motivation to attend a number of different courses. This finding supplements information reported under item 2 above, in that teachers can expect students to be motivated to acquire skills in a number of occupational areas.

5. Planning of link courses

Link courses were generally planned by colleges of further education.

In the case where one college of further education invited schools to join a combined planning committee, operations moved smoothly and efficiently. Industry representatives were also involved. The planning structures set up in the South Eastern area of South Australia have proved most suitable and would be a useful basis for link course development elsewhere. It was RECOMMENDED that schools and colleges of further education jointly plan link course programmes and involving industry representatives where appropriate.

Furthermore, it was RECOMMENDED that the organizational structures developed in the South Eastern region of South Australia be examined, analysed and reported so that other groups can utilize the findings in a manner appropriate to their needs.

6. Aims and objectives of the courses

It was generally agreed that each course was designed to develop work related skills for a particular occupational area. Nevertheless, as it was not common practice for teachers and lecturers to discuss such matters as aims and objectives, it was not possible to determine the extent of agreement.

It was RECOMMENDED that teachers and lecturers meet to develop suitable aims and objectives for each course as well as the overall programme within a given region.

7. Co-ordination involving college and secondary staff

Contact was limited to informal discussions except in the case of the South East region where formal coordination activity occurred throughout the implementation phase.

It was RECOMMENDED that lecturers and teachers jointly co-ordinate link course programmes.

OTHER MATTERS

1. There is clearly a need for link courses to operate on a 'regional' basis. A given 'region' would be determined by the schools and colleges of further education which combine to set up a programme. This may mean that a college of further education may service one or more secondary schools in a given geographical region. Where this happens, the link course programme would be focussed on the DFE college. On the other hand, where a number of colleges service one school, the regional focus would be on the school itself. This latter arrangement is more likely to occur in the metropolitan area where a particular school can relate to more than one DFE college; in this case it is the DFE colleges that occupy a given geographical region. There could also be a 'mix' of these two arrangements particularly in the metropolitan area.

In all cases the principle of joint planning, development and co-ordination is important. The proportion of school/college representation on any joint committee would vary according to the particular circumstance. As the servicing agency in all cases is one or more college of further education, it was RECOMMENDED that the chairman of the joint committee be a college of further education representative where only one DFE college is involved, but where more than one college of further education is involved then a college of further education representative and a school representative act as joint chairmen.

It was also RECOMMENDED that link course programmes operate on a regional basis as defined by the particular grouping of schools and colleges of further education.

2. There is still a need for statewide co-ordination, particularly in regard to funding, information sharing and policy formulation. For instance, the above recommendations have statewide application. They can therefore be regarded as having policy implications across the state.

Additional 'structural' recommendations were required so that a concerted statewide 'programme of programmes' could be mounted. A series of structural recommendations were to be developed by an

inter-Departmental committee in such a way as to be consistent with the recommendations stated in this paper.

It was RECOMMENDED that an appropriate inter-Departmental committee devise structural recommendations necessary to implement statewide policy.

INTERIM POLICY SINCE DETERMINED

Subsequent to a report of this exercise being submitted, it was decided to formulate interim policy for link courses in South Australia. Guidelines developed by an inter-Departmental Committee are reported below. The guidelines represent approved structural recommendations and as such testify to the usefulness of the project findings and recommendations.

Link courses should be established as the result of joint curriculum planning and documentation involving schools, colleges, and industry representatives where appropriate, and as such be considered as an integral part of a secondary student's curriculum.

In doing so:-

1. The special expertise of the educational sectors involved must be respected.
Only those aspects of Link Courses which cannot adequately be catered for by the existing resources of a secondary school should be undertaken at a D.F.E. College.

2. Link Courses should adhere to a model which introduces students to a cluster of future occupation possibilities.

3. Senior students should be counselled to, and colleges and schools make provision for students of all academic levels to 'taste' a range of vocational areas.

4. Link Courses need not be confined to traditional trade areas.
Where college resources can offer an insight into professional and para-professional vocational areas, consideration should be given to development of Link Course in these areas.

5. Special attention should be given to the needs of certain groups to develop and broaden their vocational interests, for example girls, the handicapped and isolated students.

REFERENCE BOOKS CONSULTED

The following references were consulted during the investigation and the preparation of a final report document. Some of these are cited in this paper.

BLAKERS, C

School and work. Educational Research Unit. Australian National University, Canberra, 1978.

Australian Committee on Technical and Further Education

Second Report on needs in Technical and Further Education. Australian Government Publishing Service, Canberra 1975.

Australia, Technical and Further Education Commission. Report for the Triennium 1977-1979. Australian Government Publishing Service, Canberra 1976.

Bowles, S., and Ginuts, H., "Schooling in Capitalist America" Routledge and Kegan Paul Ltd., Great Britain 1976.

Commonwealth Department of Education.

Report of the National Seminar on the Provision of Linked Courses in Australia, Canberra 18-19 April 1978.

DAVIES, A.C., KINNEAR, D.H., O'NEIL

The Unemployed Youth Programme : An Evaluation S.A. Department of Further Education, Adelaide 1978.

DAVIES, J.L.

Collaboration between Secondary Schools and Technical Colleges in the Education of the 15-18 Age Group : The Linked Course Vocational Aspect Vol. XX No. 47 pp 211-216 Autumn 1968.

Department of Technical and Further Education

Report of Evaluation Team on Pilot Link Courses conducted during 1978.

Education, Training and Employment

Report of the Committee of Inquiry into Education and Training. Australian Government Printing Service, Canberra 1979.

Education Department of South Australia

A Pilot Handbook for use in the Introduction of Work Experience into the School Curriculum January 1977.

EDWARDS, J and DUSSELDORP, R.A.

Experience - Based Career Education Report. Bureau of Occupational and Adult Education. Washington 1977.

EVANS, R. and HERR, E.

Foundations of Vocational Education. Merril Publishing Company Ohio, 1971.

FOSKETT, N.

Link Courses, Bridging Courses and the Transition from School to Work. Discussion Paper National Training Council 1978.

GOLDHAMMER, K and TAYLOR, R.E.

Career Education. Perspective and Promise. Charles E. Merrill Publishing Company 1972.

HILL, J.

A Brief Report Concerning a Conference on Link Courses held at the Murray Park College of Advanced Education. September 1977.

HOCKING, H. 1978.

HOYT, K., EVANS, R.N. MACKLIN, G.L.

Career Education. What is it and how to do it. Olympus Publishing Co. Salt Lake City 1978.

KLOEDEN L.A.

A Description of Link Course Programmes in South Australia. Department of Further Education. Adelaide, September 1977.

MALEY, D.

Cluster Concept in Vocational Education. American Technological Society, Chicago, 1975.

MOOR, C.

From School to Work. Sage Publications London 1976.

STEAD, F.L., HARNETT, R.A., PRENTISS, J.J.

A Third Party Evaluation of the Appalacian Maryland Experience - Based Career Education Project. West Virginia University 1977.

Tertiary Education Commission, Report for 1979-81, Australian Government Publishing Service, Canberra, 1978.

UNDERWOOD, K.

Career Education - A Role for the School in Vocational Development, Independent Education Vol. 5 (1) October, 1975.

THE RELATIONSHIP OF UNDERSTANDING AND EVALUATION TO OBJECTIVE MORAL JUDGMENT RESPONSES

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The purpose of this study was to investigate the association of standard objective ratings of moral judgment statements with independent measures of understanding and evaluative endorsement of the same statements. Statements are items of Rest's (1974) Defining Issues Test (DIT) stage-keyed to Kohlberg's six moral judgment stages.

Rest's objective administration and coding system for measuring moral judgment development avoids the problems of experimenter bias and coder bias to which Kohlberg's (Kohlberg, Colby, Gibbs, Speicher-Dubin, Clark, 1978) clinical interview is susceptible (Kurtines and Grief, 1974; Rest, 1979(a); Lawrence, 1978). However standardization and objectivity are gained at the loss of verbal evidence of a subject's understanding of the stimulus materials, and at the loss of information about the underlying organization of a subject's moral reasoning. The researcher must make a number of inferences about what the subject is encoding and processing, and about what s/he means by objective check-marks.

Rest follows Piaget and Kohlberg in assuming that a person's responses to hypothetical moral dilemmas provide samples of underlying moral reasoning. His test is based on the further assumption that evidence of such samples can be obtained via objective ratings and rankings of stage-keyed test items.

In the DIT a subject is presented with six dilemmas involving conflicts of human interest. For each dilemma there are 12 stage-keyed and distractor items for the subject to rate and rank as more or less adequate ways of defining the important issues in the dilemma.

Ratings are indexed by Davison's (1979) D scale score which measures how many high-staged (principled) items are preferred over low-staged (stage 2 and 3) items. Rankings are indexed by Rest's (1974, 1979(b)) P scale score which measures how many principled items are endorsed on reflection. Both scales measure developmental change, although the D scale is more sensitive to longitudinal change (Rest, 1979(a); Davison and Robbins, 1978; Davison, 1979).

Rest (1979(a)) suggests that two kinds of operation are involved in completing the DIT: (1) comprehension of the concepts imbedded in the items, and (2) evaluative endorsement or rejection of these concepts as morally adequate definitions of the dilemmas. A person first encodes and understands the stage-keyed sense of an item then judges its relative importance.

Different levels of organized moral thought are assumed to reflect different levels of understanding of stage concepts, and different levels of endorsement. For example, a person generally operating from principled moral concepts will understand the principled concepts of high-staged items and recognize their moral importance. S/he will understand low-staged items but reject them as less comprehensive ways of defining moral issues. In contrast, a low-level moral thinker operating from concepts of instrumental relativism and self-interest (stage 2) or interpersonal concordance (stage 3) will understand stage 2 and 3 items, and recognize their moral adequacy. S/he will neither fully understand, nor fully endorse high-staged principled concepts.

Any interpretation of a subject's test performance must take account of the influence of the surface structure of stimulus materials and the conceptual frames from which the reader is operating (Rumnelhart and Ortony, 1977; Baker and Stein, in preparation). Several factors related to the surface

structure of the stimuli and to the structures of the reader's thought may influence response (Cronbach and Meehl, 1955; Trabasso and Nicholas, 1980). For example, Revlis (1975) showed that logic students' deductive errors were grounded not in their logical operations, but in their initial misencoding of premises. Rest concedes that subjects may be responding to test items with idiosyncratic frames, and pilot work revealed that several graduate students were imposing their own complex interpretations onto "meaningless" distractor items (Lawrence, 1978).

While Rest, Turiel and Kohlberg (1969) found a hierarchy of preference for moral concepts above one's own level of thinking, Moran and Joniak (1979) challenged their ascription of differences to moral endorsement. They found that levels of preference were significantly affected by the use of inflated language. Freeman and Giebink (1979) found that adolescent's responses to Kohlbergian dilemma were influenced by stimulus variables of sex of story agent and situational familiarity and remoteness.

Martin, Shafto and Vandeinse (1977) revealed differences in the discriminative powers of several of the DIT staged items. They suggested that systematic order effects were confounding the preferences of subjects for high-staged items. Faulty items were detected when they obtained factor loadings discrepant from those obtained on other high-staged items (Davison, Robbins, and Swanson, 1977).

In summary, evidence of the influence of subject's frames of reference and encoding strategies, and evidence of possible confounding from surface effects of the test indicate the need to examine Rest's assumptions about the association of understanding and endorsement with DIT moral judgment ratings.

Rummelhart (1977) suggests that there are two ways of finding out if a person understands a message. One can either ask people directly, or one can require people to repeat the sense of the message in their own words. In previous studies, comprehension of DIT items was tested by an objective matching test (Rest, Coder, Cooper, Masanz and Anderson, 1974). Subjects chose which of a set of statements best summarized the idea in a passage keyed to one of Kohlberg's stages. A longitudinal study of fifty-four subjects over four years showed that 81% of subjects exhibiting upward movement on the DIT also showed upward movement on the objective moral comprehension test (Rest, 1975). Significant correlations ranged from the 30's to 60's (Rest, et al., 1974).

Moderate correlations of the DIT with various measures of cognition range from .2 to .5 with an average correlation of .36 (Rest, Panowitsch, Balkcum and Davison, 1979). These generally are lower than DIT correlations with other measures of moral thought (Rest,1976(a);1979(a)). Preference or endorsement data show that the DIT is robust against faking responses (McGeorge, 1975; Yussen, 1976) although the Moran and Joniak data indicate the importance of examining understanding and endorsement concurrently

In this study several measures of understanding and evaluative endorsement were used to test Rest's assumptions that different levels of restings of high-staged and low-staged items would be associated with different levels of understanding and evaluative endorsement of the same items. Extreme subject groups were chosen to maximize polarization on the combination of age and educational levels, the most sensitive correlate of moral judgment levels (Rest, 1976(b)).

Philosophy graduates have obtained the highest group means scores on the DIT. Ninth graders have shown low levels of DIT scores, but adequate reading skills for processing the stimuli (Rest, 1974; 1976(a)). Religious conservatives typically have obtained low scores on the DIT (Blackner, 1975; Ernsberger, 1975; Rest, 1976(a)). It was expected that philosophers with high objective moral judgment scores would understand and evaluate favourably high-staged (principled) items more consistently than either of the other two groups. They would use high-staged items more consistently than low-staged items

for defining the moral dilemmas, and they would reject low-staged items as inadequate ways of defining the dilemmas. Ninth graders with low objective moral judgment scores were expected to understand low-staged items better than they understood high-staged items, and were expected to prefer low-staged items as ways of defining the dilemmas. Conservative seminarians were expected to understand high-staged items better than the ninth graders, but to evaluate these items less favourably than the philosophers. Low mean P % scores had suggested that religious conservatives could be expected to reject principled thinking in favour of stage four law-and-order order or lower staged moral orientation (Ernsberger, 1975).

METHOD

Subjects

Three subject groups were comprised of: (1) twenty-three philosophy graduate students (13 males, 10 females) with mean age of 28.6 years. Only those philosophers with pretest D scores of 26 and above were selected from 30 volunteers from philosophy courses at an upper mid-western university; (2) twenty-three ninth graders (11 males, 12 females) with mean age of 15.3 years. Only those ninth graders with D scores of 24 or less were selected from 30 original volunteers from a middle-class school in the same city; (3) all sixteen male graduate seminarians with mean age of 27.4 years with mean D score of 24.89 from an extreme conservative seminary in the same city.

Instruments

The DIT was administered as a pretest.

A set of two dilemmas and fifteen items were re-administered in a moral judgment-making test. These two stories reflect classical dilemmas of conflicts of human interest. In the Escaped Prisoner story a woman must decide whether or not to report an exemplary prison escapee. In the Doctor's Dilemma a doctor must decide whether nor not to commit euthanasia at the request of a dying woman.

Understandability and evaluative card sorts were associated with each dilemma and its defining items. The subject was asked to sort the same 15 items on two separate dimensions: (1) first, on how well s/he understood each item, and (2) then on how much use s/he would make of each item in deciding about the dilemma. Each item was presented on a three by two inch card, in random order for sorting into piles marked from "great" to "no" understanding or decision-making use respectively. In a reproducibility paraphrase task the subject was asked to write a paraphrase of each of the 15 items, to convey the meaning s/he obtained from each item.

Analysis was confined to the six high-staged, six low-staged items.

Procedure

The DIT pretest was completed at home and returned by mail.

Approximately two weeks later each subject was tested individually by the same experimenter, either in a university, school or seminary room. Two seminarians were tested at home. No time constraint was imposed.

Each subject rated and ranked the items for the first story while thinking out loud. Responses were audiotaped. The subject was invited to record the objective responses and the experimenter kept a duplicate record. The two card sort tasks followed each story. Order was constant, with the understandability sort first to avoid contamination. After a short break the second story set was administered using the same procedure with story order counter-balanced. The sessions took between 45-90 minutes, with adults typically taking longer. At the conclusion of the session the subject was given the

reproducibility test and the DIT stimulus materials. S/he was asked to complete the paraphrase task and mail in the test within two weeks. Most subjects complied a few were re-contacted.

RESULTS

1. DIT Importance Ratings.

As expected the patterns of importance ratings of low-staged and high-staged items obtained from philosophers were different from those obtained from ninth graders and seminarians. A multivariate analysis of variance with repeated measures showed significant interaction effects for item type by subject group for the planned comparison of philosophers versus ninth graders and seminarians combined, $F(1,59)=81.745$, $p < .0001$.[1] In addition, interaction effects for item type by subject group was significant for ninth graders versus seminarians, $F(2,59)=13.646$, $p < .0001$. All planned comparisons in the study were made using Helmert contrasts of Finn's (1977) multivariate analysis programme.

Philosophers gave low-staged items low importance ratings and high-staged items high importance ratings. Ninth graders' importance ratings did not differ for the two types of items. Seminarians gave all items low importance ratings, but they rejected low-staged items more consistently. Mean importance ratings are shown in Table 1, and interaction effects are illustrated in Figure 1(a).

Table 1

Mean Importance Ratings for Low-Staged and High-Staged Items

	ITEM TYPE	
	LOW-STAGED	HIGH-STAGED
SUBJECT GROUP		
Philosophers (n = 23)	3.80	2.03
s.d.	.78	.56
Ninth Graders (n = 23)	3.01	2.69
s.d.	.62	.76
Seminarians (n = 16)	4.81	3.59
s.d.	.26	1.29

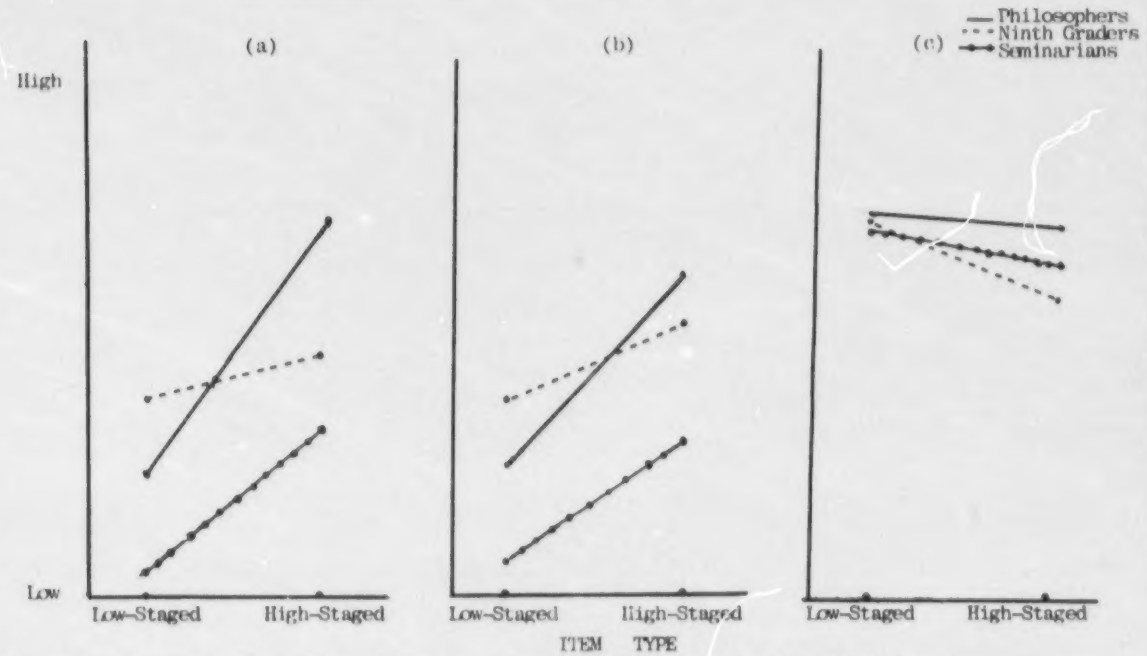

Figure 1: Interaction effects for item type by subject group; for ratings of DIT items on (a) Importance, (b) Decision-Making, (c) Understandability.

2. Evaluative Endorsement of Items for Decision-Making.

As expected the patterns of evaluative endorsement ratings obtained from philosophers on the decision-making card sort were different from those obtained from ninth graders and seminarians. The multivariate analysis of variance showed significant interaction effects for item type by subject group for the planned comparison of philosophers versus ninth graders and seminarians combined, $F(1,59)=7.909$, $p < .01$. Although the multivariate interaction effect for ninth graders versus seminarians was not significant ($p > .05$), the univariate interaction effect was significant $F(2,59)=8.925$, $p < .001$.

Philosophers gave unfavourable ratings to low-staged items, and favourable ratings to high-staged items. Ninth grader's decision-making ratings did not differ for low-staged and high-staged items. Seminarians rejected low-staged items for use in decision-making, and also gave high-staged items low ratings. Mean decision-making ratings are shown in Table 2, and the interaction effects are illustrated in Figure 1(b).

Table 2

Mean Decision-Making Ratings for Low-Staged and High-Staged Items

	ITEM TYPE	
SUBJECT GROUP	LOW-STAGED	HIGH-STAGED
Philosophers (n = 23)	3.73	1.98
s.d.	.73	.51
Ninth Graders (n = 23)	3.06	2.49
s.d.	.61	.73
Seminarians (n = 16)	4.72	3.52
s.d.	.40	1.13

3. Understanding of the Items.

Evidence of a subject's understanding of the items was obtained in three ways: (a) by ratings on the understandability card sort which indicated how well a subject said s/he understood an item, (b) on reproducibility test paraphrases of the items which were coded for matches to stage-keyed concepts, and (c) any subject's voluntary expression of confusion during the verbalization of DIT importance ratings.[2]

(a) Understandability ratings of items.

As expected the patterns of understandability ratings of low-staged and high-staged items obtained from philosophers were different from those obtained from ninth graders and seminarians. The multivariate analysis of variance showed a significant interaction effect for item type by subject group for the planned comparison of philosophers versus ninth graders and seminarians combined, $F(1,59)=17.796$, $p < .005$. In addition the interaction effect for item type by subject group was significant for ninth graders versus seminarians, $F(2,59)=5.919$, $p < .05$. While all of the groups signified that they understood the high-staged items by their ratings, the philosophers gave these items higher ratings. Mean understandability ratings are shown in Table 3, and interaction effects are illustrated in Figure 1(c).

(b) Understanding the stage-related sense of items.

Each subject reproduced the meaning of low-staged and high-staged items in a written paraphrase. Paraphrase reproductions were coded by two independent coders into six classifications indicating whether a subject reproduced the item in its given stage-keyed concept. Inter-judge agreement was calculated for 1460 separate codings of the 12 items. Percentage agreement was 83% and the Cohen's Kappa was .64(Tinsley

and Weiss, 1975).

Table 3

Mean Understandability Ratings of Low-Staged and High-Staged Items for Three Groups

SUBJECT GROUP	ITEM TYPE LOW-STAGED	HIGH-STAGED
Philosophers (n = 23)	1.30	1.46
s.d.	.40	.47
Ninth Graders (n = 23)	1.41	2.18
s.d.	.48	.62
Seminarians (n = 16)	1.26	1.79
s.d.	.31	.63

Philosophers reproduced high-staged items in their stage-keyed sense more frequently than the other two groups. However, the three groups did not differ in their stage-keyed reproductions of low-staged items. Seventy-five percent of the philosophers' paraphrases of high-staged items were coded as reproductions of the principled sense of these items, in contrast with 44 percent of the seminarians' and 23 percent of the ninth graders' paraphrases. The proportion of high-staged items reproduced by philosophers was significantly greater than the proportion reproduced by seminarians ($z=5.38$, $p < .01$) which in turn was significantly greater than the proportion reproduced by ninth graders ($z=3.28$, $p < .01$). Pairwise comparisons were made using Ferguson's (1966) comparison of independent proportions.

(c) Subjects expressed lack of understanding of items.

The ninth graders' understandability ratings and stage-keyed reproductions showed they did not understand high-staged items. These trends were supported by their voluntary expressions of not being able to understand high-staged items which verbalizing their DIT importance ratings. Seventy percent of the ninth graders freely expressed difficulty in understanding high-staged items, compared with 22% of the philosophers and 19% of the seminarians. A significant difference was found between the number of ninth graders and the number of philosophers who volunteered at least one "Don't Understand" response to low-staged and high-staged items $\chi^2(1)=6.1$, $p < .05$. Sixteen ninth graders volunteered a "Don't Understand" response to high-staged items, versus three to low-staged items. In contrast five philosophers said "Don't Understand" to high-staged versus seven to low-staged items. Only three seminarians volunteered "Don't Understand" to high-staged items and none to low-staged items. Thus their freely expressed confusion with high-staged items was supportive of the rating and paraphrase data obtained from the ninth graders.

4. Correlations of importance, evaluative and understanding ratings.

DIT importance ratings and evaluative decision-making ratings correlated significantly for all groups. Neither importance or evaluative decision-making correlated significantly with understandability except for one significant moderate correlation for decision-making and understandability obtained for ninth graders, $r=.46$, $p < .05$. Intercorrelations for the three groups are shown in Table 4. The patterns of the intercorrelations indicate a similarity in the importance and decision-making ratings, but no similarity for understanding and either importance or decision-making. Understanding alone could not account for DIT importance ratings; importance ratings were closely associated with evaluative preferences.

Table 4

Pearson Product Moment Correlations of DIT Importance, Decision-Making, and Understandability Ratings, for Low-Staged and High-Staged Items

GROUPS	ITEM TYPES: LOW ITEMS DIT RATINGS	LOW ITEMS DECISION-MAKING	HIGH ITEMS DIT RATINGS	HIGH ITEMS DECISION-MAKING
PHILOSOPHERS (n = 23)				
DIT RATINGS		.88***		.56***
UNDERSTANDING	-.08	.10	-.37*	.13
NINTH GRADERS (n = 23)				
DIT RATINGS		.70***		.82***
UNDERSTANDING	-.14	-.12	.23	.46*
SEMINARIANS (n = 16)				
DIT RATINGS		.49*		.28
UNDERSTANDING	-.29	.05	-.71***	-.54*

* p <.05, ** p <.01, *** p <.001.

DISCUSSION

Three subject groups with different scores on the DIT pretest showed different trends in their endorsement and understanding of DIT high-staged and low-staged items for two moral dilemmas. The data generally supported Rest's assumption that responses to the importance of stage-keyed statements would involve a person in understanding the statements, and in evaluating them for their adequacy as ways of defining moral dilemmas.

Neither evaluative endorsement nor understanding alone described the subject groups' judgment of the relative importance of items which expressed principled moral concepts and items which were predicated on self-interest or interpersonal concordance. Taken together, measures of evaluative endorsement and understanding of the same items showed differences in the way subjects processed high-staged principled items and stage two and three items. Subjects could understand items and not endorse them, as the philosophers and seminarians did with low-staged items; or subjects could understand items poorly but endorse them, as the ninth graders did with high-staged items.

Different patterns of endorsement and understanding of the two types of items were obtained from groups of philosophy graduate students and ninth grade students who were polarized on DIT pretest moral judgment scores and on age and years of education. Different patterns were obtained for the philosophers and conservative seminarians who were similar to the philosophers in age and years of education, but different from them in pretest moral judgment scores.

Philosophers with high moral judgment scores understood low-staged items but rejected them in their decision-making. They also understood high-staged items and endorsed them as ways of defining the two dilemmas. The seminarians consistently rejected low-staged items which they understood as expressions of self-interest and interpersonal concordance. However the principled concepts of high-staged items were not understood by the seminarians as consistently as by the philosophers, and were rejected as not matching their conservative religious frames of reference.

The response patterns of the ninth graders were consistent with trends found in earlier comprehension studies. In Kohlbergian interviews, Rest (1973) found that 12 year olds preferred moral judgment concepts of higher stages than their own spontaneous productions, and also understood higher concepts than they expressed. In the present data 15 year olds gave similar levels of endorsement to principled concepts which they did not understand fully, and low-staged concepts which they understood.

In the pretest low-staged items had been consistently rated as important, as was indexed by their lower score on Davison's D scale which indexes the rating of low-staged items in relation to principled items (Davison, 1979). The inconsistency of the ninth graders was shown by their self reported understanding of the high-staged items on the card sort, and their expressions of confusion with these items in their spontaneous verbalizations. They did not paraphrase high-staged items in their principled sense.

While the card sort and paraphrase tests were open to diagnostic problems, their potential for error was different. The card sorts were open to false positives of diagnosis, and the paraphrase test was open to false negatives (Flavell and Wohlwill, 1969; Flavell, 1977). When used together on the same stimulus materials and the same subjects the measures provided consistent trends of differences between the philosophers and the lower scoring groups.

The robustness of the decision-making card sort and the DIT importance ratings is supported by McGeorge's (1975) "Fakability" study. College students were unable to produce DIT rankings at levels of response higher than their own even under instruction to do so.

The use of the reproducibility paraphrase test provided a means of checking for any social desirability responses subjects might give on the understandability card sort. False negatives were more likely in the assessment of a subject's understanding of an item according to an *a priori* set of stage-keyed criteria. However the philosophers' superiority in understanding the high-staged items was consistent across tests.

Whether or not seminarians and ninth graders would have reproduced the principled sense of the high-staged items under other conditions, they did not when asked to re-state their understanding of these items which they met on several occasions.

The findings of this study indicate the usefulness of examining further the different dimensions of subjects' responses to statements keyed to moral judgment stages. Rest, Panowisch, Balkcum and Davison (1979) showed how moral judgment scores correlated differently with measures of conceptual ability and other measures of moral thought. Greater correlations are found between tests involving some kind of moral evaluation than with tests of intelligence and conceptual ability. In the present study, high and low levels of moral thinking as indexed by DIT's objective scores were shown to have different patterns of association with understanding and endorsement of the same examples of high and low staged thinking.

NOTES

[1] Multivariance analyses were made using Stepdown F's which were ordered *a priori* on theoretical grounds.

[2] All subjects' verbalized expressions were analyzed in the larger study (Lawrence, 1978).

REFERENCES

BAKER, L., and STEIN, N. The development of prose comprehension skills. Technical report No.102, Center for the Study of Reading, University of Illinois, 1978.

BLACKNER, G.L. Moral development of young adults involved in weekday religious education and self-concept relationships. (Doctoral dissertation, Brigham Young University, 1975). Dissertation Abstracts International, 1975, 35 08A. (University Microfilms No.75-04, 160).

CRONBACH, L.J. and MEEHL, P.E. Construct validity in psychological testing. Psychological Bulletin, 1955, 52(4), 281-302.

DAVISON, M.L. The internal structure and the psychometric properties of the Defining Issues Test. Ch.9 in J.R. Rest, Development in Judging Moral Issues, Minneapolis: University of Minnesota Press, 1979, 223-245.

DAVISON, M.L. and ROBBINS, S. The reliability and validity of objective indices of moral development. Journal of Applied Psychological Measurement, 1978, 2, 389-401.

DAVISON, M.L., ROBBINS, S. and SWANSON, D. Stage structure on objective moral judgments. Developmental Psychology, 1978, 14(2), 137-146.

ERNSBERGER, D.J. Intrinsic-extrinsic religious identification and levels of moral development. (Doctoral dissertaion, University of Texas, 1975). Dissertation Abstracts International, 1975, 37, 6302B.

FERGUSON, G.A. Statistical Analysis in Psychology and Education. (2nd ed.), London: McGraw-Hill, 1966.

FINN, J.D. Multivariance : Univariate and Multivariate Analysis of Variance, Covariance, Regression and Repeated Measures. A Fortran IV Program, Version VI, September, 1977. Chicago: International Educational Services, 1977.

FLAVELL, J.H. Introduction to Cognitive Development. Englewood Cliffs, N.J.: Prentice-Hall, 1977.

FLAVELL, J.H. and WOHWILL, J.F. Formal and functional aspects of cognitive development. In D. Elkind and J.H. Flavell (eds.), Studies in Cognitive Development : Essays in Honour of Jean Piaget. New York: Oxford University Press, 1969 60-120.

FREEMAN, S.J.M. and GIEBRIK, J.W. Moral judgment as a function of age, sex and stimulus. Journal of Psychology, 1979, 102, 43-47.

KOHLBERG, L., COLBY, A., GIBBS, J., SPEICHER-DUBIN, and POWER, C. Assessing moral stages : A manual. Unpublished manuscript, Harvard University, 1978.

KURTINES, W. and GRIEF, E. The development of moral thought : Review and evaluation of Kohlberg's approach. Psychological Bulletin, 1974, 81, 453-470.

LAWRENCE, J.A. The components of moral judgment-making. Unpublished doctoral dissertation, University of Minenesota, 1978.

McGEORGE, C. The susceptibility to faking of the Defining Issues Test of moral development. Developmental Psychology, 1975, 11, 108.

MARTIN, R.M., SHAFTO, M. and VANDEINSE, W. The reliability, validity and design of the Defining Issues Test. Developmental Psychology, 1977, 13, 460-468.

MORAN, J.J. and JONIAK, A.J. Effect of language on preference for responses to a moral dilemma. Developmental Psychology, 1979, 15(3), 337-338.

REST, J.R. Development in Judging Moral Issues. Minneapolis: University of Minnesota Press, 1979(a).

REST, J.R. The hierarchical nature of moral judgment. Journal of Personality, 1973, 41, 86-109.

REST, J.R. Longitudinal study of the Defining Issues Test : A strategy for analyzing developmental change. Developmental Psychology, 1975, 11, 738-748.

REST, J.R. Manual for the Defining Issues Test : An objective test of moral judgment development. University of Minnesota, 1974.

REST, J.R. Revised Manual for the Defining Issues Test. Minneapolis: Moral Research Projects, University of Minnesota, 1979(b).

REST, J.R. Moral judgment related to sample characteristics. Technical Report No.2, University of Minnesota, 1976(a).

REST, J.R. New approaches in the assessment of moral judgment. In T. Lickona (ed.), Moral Development and Behaviour : Theory and Research, and Social Issues. New York: Holt, Rinehart and Winston, 1976(b), 198-220.

REST, J.R., COOPER, D., CODER, R., MASANZ, J. and ANDERSON, D. Judging the important issues in moral dillemmas : An objective measure of development. Developmental Psychology, 1974, 10(4), 491-501.

REST, J.R., DAVISON, M.L. and ROBBINS, S. Age trends in judging moral issues : A review of cross-sectional, longitudinal and sequential studies of the Defining Issues Test. Child Development, 1978, 49, 263-279.

REST, J.R., PANOWITSCH, H.R., BALKCUM, E. and DAVISON, M.L. The relation of moral judgment to cognitive development : Looking for Dr. Strangelove. Unpublished manuscript, University of Minnesota, 1979.

REST, J.R., TURIEL, E. and KOHLBERG, L. Level of moral development as a determinant of preference and comprehension of moral judgment made by others. Journal of Personality, 1969, 37, 225-252.

REVLIS, R. Syllogistic reasoning : Logical decisions from a complex data-base. In R.J. Falmagne (ed.), Reasoning : Representation and Process. Hilsdale, New Jersey: Lawrence Erlbaum and Associates, 1975, 93-133.

RUMELHART, D. An Introduction to Human Information Processing. New York: Wiley, 1977.

RUMELHART, D.E. and ORTONY, A. The representation of knowledge in memory. In R.C. Anderson, R.J. Spiro and W.E. Montague, Schooling and the Acquisition of Knowledge. Hillsdale, N.J.: Lawrence Erlbaum Associates, 1977, Ch.4, 99-136.

TINSLEY, H.E. and WEISS, D.J. Inter-rater reliability and agreement of subjective judgments. Journal of Counselling Psychology, 1975, 22(4), 358-376.

TRABASSO, T. and NICHOLAS, D.W. Memory and inferences in the comprehension of narratives, Ch.9 in F. Wilkening, J. Becker and T. Trabasso (eds.), Information Integration by Children. Hilsdale, N.J.: Lawrence Erlbaum Associates, 1980, 215-265.

WINER, B.J. Statistical Principles in Experimental Design. New York: McGraw-Hill, 1962.

YUSSEN, S.R. Moral reasoning from the perspective of others. Child Development, 1976, 47, 551-555.

STUDENT CHARACTERISTICS, MOTIVATIONAL AND PROCESS FACTORS IN RELATION TO EFFECTIVE CAREER DEVELOPMENT

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Abstract

In this study student background characteristics and certain personological characteristics, including motivations for schooling and types of learning strategies employed, are related to affective and cognitive aspects of adolescent career development.

A Career Development Inventory, Learning Process Inventory, Word Knowledge test and General Information Questionnaire (addressing demographic and career decision-making topics) were administered to national random samples of 14-year-old and Year 11 students. Canonical correlations distinguished four modes of career decision making and associations with student characteristics suggested the motives and strategies that plausibly might enter into these aspects of career development. Commonality analysis indicated the relevant importance of background and personological factors in career development. Some implications are suggested.

Introduction

There are several dimensions of effective career development during adolescence. The aim of the present study is to clarify relationships between different aspects of career development, and career decision making (CDM), and several demographic and personological variables. In particular we are interested in how motivational orientations to school, approaches to school learning, locus of control, and ability to relate to affective and cognitive aspects of career development.

Theoretical Framework

Career development (CD) is a process, involving both growth and learning, which takes place over a considerable period of time. It is assumed that vocational behaviours mature in a systematic fashion; that the maturation process can be facilitated by appropriate experience; and that tasks characteristic of the various stages of CD need to be accomplished (Super, 1969; Crites, 1973). 'Crystallizing' a vocational preference is the task most relevant to the secondary school years.

In crystallizing their areas of preference students develop their pictures of themselves in preferred job roles through the process of 'exploration'. 'Exploration' involves seeking information, both about one's own abilities and interests as well as about aspects of a wide variety of occupations, and endeavouring to reach conclusions about preferred vocational areas (Super, 1963). While the process may be influenced by factors beyond an individual's control, such as unemployment, the theory emphasises self-determination in CD (Herr, 1978).

The construct of 'vocational maturity' (VM) has been introduced in the literature to denote degree or level of career development (Super, 1963; Crites, 1973). Vocationally mature adolescents, who are coping (or have already coped) effectively with the exploration process, are aware of the need to plan for the future and to accept responsibility for their own career decision-making (CDM). They have most likely already made some plans related to their future career areas, have some understanding of their own abilities and interests, possess information about a variety of aspects of the world of work, and know how to integrate these factors in making well-informed decisions.

A particularly interesting question, which to date has not received much direct research, is how the student's typical or habitual motivations and strategies for learning and problem solving may

relate to VM, and to CDM in particular.

Biggs (1978) suggests that a student's motivations or intentions in the context of a learning institution, such as school or university, will determine his typical strategies or "self-regulatory systems" (Mischel, 1973) of coping within the institution.

Several motivational components may be distinguished; three are selected as being of particular importance, each of which has an associated coping strategy. These are:

Motive	Strategy
1. Instrumental: learning is a means to an end, such as a qualification. Pass only aspirations.	Reproducing: target reduced to bare essentials and rote learned for accurate reproduction. Additional or optional material is avoided.
2. Intrinsic: learning is interesting for its own sake. Extract maximum meaning.	Meaning: wide reading along own interest, inter-relating with prior knowledge, seeking maximum meaning.
3. Achievement: learning a medium to display status, drive for top grades.	Organising: follows suggested readings, meets all schedules for assignments, organises day into study modules, "model student".

Table 1: Three motives for learning and their associated strategies

While students may be interested in one subject, have pass only aspirations in another, and aim for highest grades in a third, they do on the whole tend to approach the generality of their studies with a predominant motivational or intentional disposition, and deploy their learning strategies accordingly. The question here is whether high school students' career motives, and strategies for arriving at career decisions, would follow the pattern they have established in the context of schooling. For example, it seems likely that instrumentally motivated students would have low level attitudes towards work, and take minimally self-involving steps about seeking career information; that students who are intrinsically interested in school subjects are likely to seek employment that embodies those interests and would actively seek information about such jobs; and that students high in achievement motivation and organised learning strategies would manifest relatively high levels of VM.

Locus of control (LC) and ability variables are included in the investigation as previous research has shown the cognitive aspects of VM to be moderately related to ability, and both the cognitive and attitudinal aspects to be related to degree of internality of control (Lokan and Boss, 1977).

Students with an internal LC are those who believe that they have some control over what happens in their lives, in contrast to students with an external LC who believe that what happens to them is governed by external forces such as luck, fate or 'powerful others' (Rotter et al, 1972). Students with an internal LC have been shown both to seek and to possess more information related to problem situations presented to them as skill-controlled than students with an external LC (Phares, 1968). In so far as CD is perceived as a problem situation then, internally oriented students could be expected to be more highly developed on those aspects of VM that involve the seeking and possession of information.

Methodology

Instruments

1. General Information Questionnaire

Information on various student characteristics such as sex, date of birth, educational and occupational aspirations, parental occupation and so on were collected by means of a General Information Questionnaire. The questionnaire also contained seven items (LC) designed to assess degree of belief in internality of control, to which the students responded on a 4-point scale from 'Strongly agree' to

Analyses

In this paper, we are concerned with the general relationships between the VM domain and the other variables. In later analyses, we hope to report how strategy, motivation, LC and ability may interact to affect various aspects of VM.

Two analyses were carried out at this stage: 1. Canonical correlation, and 2. Commonality analysis. We report and discuss each analysis separately.

1. Canonical correlation

In canonical correlation, the aim is to discover a minimal number of orthogonal vectors that express maximal association between two conceptually distinct domains (Weiss, 1972). In this case the domains are: (i) the career-related variables: the five CDI scores, SES of proposed occupation, certainty of job choice, information about that job, and self-knowledge concerning job requirements; and (ii) student characteristics: sex, year (for age 14s only), WK, Ethnicity, Father's SES, educational aspirations, self-rated achievement, satisfaction with achievement, the 6 LPI scores, and LC.

Canonical correlations were calculated separately for the Age 14 and the Year 11 samples. In each case, four significant ($p < .01$) canonical variables were obtained. The loadings of the original variables are given in Table 2.

Variable	(a) Age 14 (N=1134) 1	2	3	4	(b) Year 11 (N=902) 1	2	3	4
SES (aspiration)	-58		78		-53		79	
Job certainty		39		-69		54		
Job information		39		-49		53		-46
Self-knowl.		37		-70		56		-54
CDI: Planning	38	78			35	81		
Resource Use		75				80		
Knowl. Proc.		58				51	32	-47
Knowl. Work	74				65			
Dec-Making	81	-32			88			32
Sex					31			79
Year			55		-	-	-	-
Wd. Knowl.	71				71	-33		
Ethnicity							-52	
Father SES								
Educ. Aspir.	66		-68		68		-65	
Self-rated Ach.	46				43			-34
Satisf. Ach.				-68				
LPI: Instrument					-33			
Intrinsic		73				60		
Achieve.		45				36		-36
Reproduct.	-41				-50			
Meaning		77				80		
Organis.		66				71		
Locus Control	70			-32	55			-34
Canonical correlation	.72				.70			

Table 2: Canonical variable loadings for (a) Age 14 and (b) Year 11 samples (Decimals omitted; only correlations > .30 are reported)

'Strongly disagree'. Internal consistency reliabilities (α) of the LC scale were 0.75 in the 14 year-old sample and 0.72 in the Year 11 sample.

Father's occupation was used to indicate socioeconomic status; responses were coded according to the 16-point ANU1 scale (Broom et al., 1977). Two 'ethnicity' variables were used: 'Do/do not speak English at home and 'father born in Australia/other English-speaking country/non-English-speaking country'.

2. Word Knowledge Test (WK)

Verbal ability was assessed by the 40-item Word Knowledge test, 14-year-old version, developed for the IEA studies (Thorndike, 1973). Words are presented in pairs and the students respond by marking whether the words in a pair mean nearly the same as or nearly the opposite of each other. A correction for guessing is applied. Results from previous studies in Australia have shown the test to be reliable, and to be unlikely to have a ceiling effect for students in Year 11. WK essentially reflects verbal ability.

3. Career Development Inventory (CDI)

The main 'level of career development' variables were assessed by means of the revised Australian adaptation (Form IV) of Super et al's (1979) Career Development Inventory (CDI) prepared at ACER. The CDI contains 88 items grouped into five factor-based scales, two of which are attitudinal and three cognitive. Factor analysis of the attitude subscales and cognitive scales yields two 'clean' factors, one of which is attitudinal and one cognitive. The five main scales are:

A. Orientation toward Planning
B. Awareness and Use of Resources
C. Knowledge of the Career Development Process
D. Knowledge of the World of Work
E. Knowledge and Application of Decision-making Principles.

Internal consistency reliabilities of the scales (α) ranged upwards from 0.67; and for the total Attitude and Knowledge sections were .90 and .82, respectively.

4. Learning Process Inventory (LPI)

Motivational and strategic aspects of learning were assessed by the LPI, which was being normed in the main part of the investigation. The LPI is a self-report instrument, containing six Likert-format items for each of the three motive and three strategy components described above. αs ranged from .43 to .70.

Administration

All instruments were administered in a specified order, usually in a single two-hour session, in July-August, 1979. The administration was handled in each school by a co-ordinator nominated by the school, usually a careers teacher, adviser or counsellor.

Samples

Two-stage cluster sampling was used to select Australia-wide samples of about 1250 students at each of two secondary school levels. The target populations were (1) all students turning fourteen between 1 October 1978 and 30 September 1979, thereby enabling co-ordination with another project being carried out at ACER, and (2) all students in Year 11 in 1979. A random sample of 50 schools was drawn, each school having a probability according to size of being selected; and then clusters of 27 students were randomly selected from each school. Sampling error is estimated at less than 6%.

For the purposes of calculating norms for the CDI and LPI, certain adjustments needed to be made so that the differing numbers of students per cluster were allowed for, but this was unnecessary for the analyses reported in this paper. Data for approximately 1150 students at each year level were initially included in the analyses described.

The four canonical variables that emerged in each sample are quite similar to each other. Each presents aspects of VM that relate what appear to be kinds of CDM to student characteristics:

1. Cognitive (deliberative) CDM. The highest loading in each sample is from the cognitive CDI scales in which the student judges appropriate courses of action on a series of case studies (Decision Making) and manifests a good knowledge of the world of work. Such students themselves have high occupational aspirations (a high score indicates low SES) and have devoted some thought to planning their careers. This pattern is associated with high verbal ability, satisfaction with present achievement, the intention to continue with formal education, avoidance of reproductive learning strategies, and high internal LC. In the Year 11 sample, this mode of CDM is associated also with low instrumental motivation and tends to be adopted more by girls.

2. Affective (concerned) CDM. This aspect of decision making is defined more by the affective scales from the VM domain, the two highest variables (Planning and Use of Resources) requiring the student to take active steps in planning and to consult with knowledgeable others, and by the self-rating scales on career choice. In the Age 14 sample there is a slight association with inability to make good decisions; and correspondingly in the Year 11s, to be lower on verbal ability (the brighter students possibly choosing the "deliberative" route to CDM). This mode of CDM is associated with high motivation, both intrinsic and achievement, and an organised, meaning-oriented approach to learning. Whereas "deliberative" CDM is cognitive and detailed, "concerned" CDM suggests current self-involvement.

3. Low aspiration CDM. This is defined by the intention to seek low SES jobs, which in the Year 11s is accompanied by some knowledge of the process of choosing a career. This is associated reasonably with the intention to leave school early, which increases as the student reaches higher year levels. In the Year 11s, "low aspiration" CDM is endorsed by English-speaking rather than by non-English-speaking students, but the reason for this is not clear.

4. Uncertain CDM. The pattern between the two samples is slightly different here, although the underlying dynamics are similar. The Age 14s who are uncertain of the future have little information either about themselves or their jobs, and are dissatisfied with current achievement levels, with a tendency to external LC. The Year 11s have little job information or self-knowledge but interestingly may yet make reasonable decisions about others; they tend to be female, with low achievement motivation, poor achievement and external LC.

These results confirm that the CDI scales form a two-factor structure, but they go beyond simply saying that students tend to check the scales in two separable but distinct ways. The correlations between the canonical variables and the individual difference variables show that different students are endorsing each set of commonalities from the VM domain. In other words, we seem justified in describing the canonical variables as representing four different modes of CDM. These patterns, apart from the first, tend to become clearer with age, presumably as the time for making career decisions looms closer.

The deliberative pattern of CDM is followed by bright students, with long term career and educational intentions; the personally concerned pattern by those who are highly motivated and organised in their approach to learning. The low aspiration pattern, which may not be as maladaptive as it seems, is associated with students who have low career aspirations and who intend to leave school early. The final pattern certainly seems to reflect vocational immaturity and indecisiveness, marked as it is by uncertainty and low motivation. If the first pattern particularly is followed by "Origins" (internal LC) the last one is that of the "Pawns" (external LC) (De Charms, 1968).

2. Commonality analyses

The next question was to determine the relative strength of association between VM and the various student characteristics. We concentrate here on the first two modes of CDM, and to simplify matters we took the total Attitude and total Knowledge scores of the CDI as criteria in commonality analyses (Kerlinger and Pedhazur, 1973).

Commonality analysis is a regression-based technique which enables the explained variance in the criterion variable to be divided into components. The components reflect the unique and common variances among the predictor variables in order to help identify the relative influences of these variables. The technique is similar to step-wise regression, but involves fewer assumptions in that it allows for all possible orderings of blocks of variables, and yields data on variances shared between blocks.

To keep the analyses in the present study manageable, a subset of the independent variables (those which seem most likely to be ordered in a causal sequence, though no such assumption is being made at this stage) was selected and grouped into three categories:

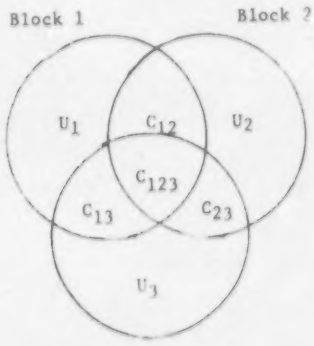
Block 1: - sex (1 = male, 2 = female)
- socioeconomic status (prestige rating of father's occupation: 1 = high)
- degree of ethnicity (father's country of birth: 1 = non-English-speaking; 2 = English-speaking, outside Australia; 3 = Australia)
- Year level (14 year-old sample only)

Block 2: - locus of control (scored in direction of internality = high)
- verbal ability (corrected Word Knowledge score)

Block 3: - scores on the three learning process motives and the three learning process strategies measured by the LPI.

The blocks in turn are considered to reflect students' background characteristics, student personal characteristics other than learning processes, and the learning processes themselves.

The personality and environmental factors (Blocks 1 and 2) are regarded as 'presage' factors, in the model proposed by Biggs (1978), which are presumed to affect performance, or outcome, by way of the learning process variables (Block 3). The relationships of the unique, common and total variances for the blocks of variables can be depicted by a Venn diagram as follows (Ross, 1980):

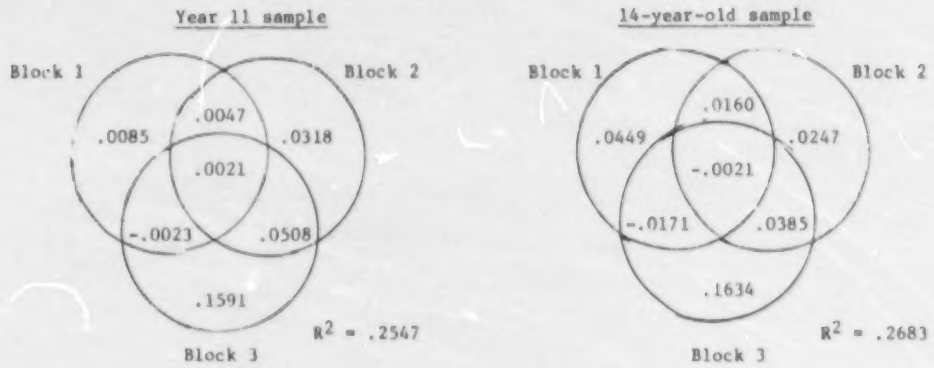


U_1 : unique to Block 1, etc.
C_{12} : common to Blocks 1 and 2 only, etc.
C_{123}: common to all Blocks

The area covered by all three circles (the seven areas shown) represents the percentage of variance in the criterion accounted for by all the predictors.

The results obtained for the 'attitude' and 'knowledge' criteria in each sample are presented in the following diagrams:

Criterion Level of Career Development Attitudes



Criterion Level of Career Development Knowledge

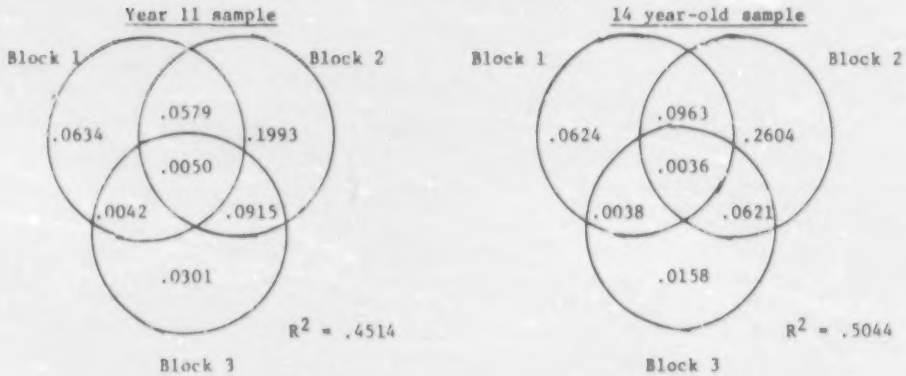


Figure 1: Venn Diagrams depicting commonality analyses (proportions of variance)

Table 3 reports essentially the same data converted to percentages, where the relative contributions may be more readily seen.

Variance	Source	(a) Age 14 Affect.	(a) Age 14 Cogn.	(b) Year 11 Affect.	(b) Year 11 Cogn.
Unique :	Student Background (B_1)	4.5	6.2	.9	6.3
	Ability and LC (B_2)	2.5	26.0	3.2	19.9
	Learning Processes (B_3)	16.3	1.6	15.9	3.0
Common :	B_1 with B_2	1.6	9.6	.5	5.8
	B_2 with B_3	3.9	6.2	5.1	9.2
	B_1 with B_3	- 1.7	.4	- .2	.4
	B_1 with B_2 with B_3	- .2	.4	.2	.5
Total :	Unique and Common	26.8	50.4	25.5	45.1

Table 3: Percent variance from unique and common sources contributing to CDI Affective and Cognitive scales

As far as attitudes are concerned, the unique contributions of Blocks 1 and 2 are relatively small, as are the shared variances involving these blocks. The greatest contribution by far in both samples arises from the learning process variables, mostly uniquely but also in common with ability and LC.

The same is not true for the knowledge criterion, for which the unique contributions of Blocks 1 and 3 in both samples are relatively small compared with the contribution of the student personal characteristics variables in Block 2. The learning process domain here contributes only in common with Block 2. The unique contribution of Block 1 is slightly less than the shared contribution involving Block 1 in each sample, while the shared contribution of Block 1 is about four times as much as its unique contribution in the 14 year-old sample and about three times as much in the Year 11 sampl .

The main point of these analyses was to assess relative contributions from the three blocks of predictors to affective and cognitive vocational maturity. Before we summarise these findings and draw some conclusions about the factors in VM, we might at the theoretical level comment that in both aspects of VM, after the unique contributions have been removed, the contributions in common from the learning process and psychological domains was comparatively high, particularly in the Year 11 sample. This is at least in keeping with Biggs' (1978) model suggesting that learning processes may moderate the effects of personological variables on both cognitive and affective outcomes, but it does not support it with respect to demographic or other background variables. Different analyses would be necessary however to test the model more stringently.

To summarise, Blocks 2 and 3 uniquely and in common account for the greater part of variance of Affective CDI in both samples. When we look at the standardised regression coefficients (not reproduced here) it turns out that LC and all three strategies account for the obtained significance, with only one motive (intrinsic) being significant. This suggests that "concerned" CDM (as being more defined by the affective scale scores; see Table 2) involves a belief in one's control over CDM and an organised attack on sources to extract maximum meaning from them. The student's background is irrelevant, which is in keeping with the notion that affective or concerned CDM is an existential process that occurs when the student perceives the need. Indeed, affective CDM is regarded by Super as more vocationally mature.

Cognitive or deliberative CDM is strongly related to an internal LC and to ability; after that background factors appear to play a part, while motivation and learning strategies are less relevant (but more so at Year 11 than at Age 14). In both groups the joint contribution of Blocks 2 and 3 is again quite high, suggesting that there may be interactions between the Blocks 2 and 3. It will be the task of further analyses to disentangle what some of these may be.

Conclusions and Implications

This study represents only a first look at some of the first order associations between vocational maturity and various student characteristics. Two main questions are considered:

1. What are the various kinds of CDM; and what student characteristics are associated with these?

2. What is the relative effect on affective and cognitive vocational maturity of different kinds of student characteristics, such as background factors (over which the student has no little control); his ability and locus of control; his motivational and strategic approaches to school learning?

On the information available here, four aspects of vocational maturity were discovered, which

amounted to four different approaches to career decision making: intellective or deliberative, concerned and personally involved, low aspiration, and uncertain or confused. By looking at the various student characteristics that were associated with these four modes of CDM it is possible to make some inferences about the kinds of student that opt for each of these patterns; and possibly, why they did so.

On the question of relative strength of effects, the affective aspects of CDM were seen to relate strongly to the students' coping strategies, presumably developed by his motivation for and his experiences in coping with schoolwork; while the cognitive aspects were determined more by personality and ability and personal background.

As for the Career Development Inventory itself, these data tend to confirm both the theory of crystallizing and exploring, and to cross-validate the scale scores with other data. Students with different motivations and strategies for exploring tend to go about this task in keeping with their modus operandi: bright students by gathering relevant knowledge; motivated students by becoming involved in the process and deploying their typical learning strategies accordingly.

What these findings do not tell us, of course, is what happens at the actual interface between school and work. How do these different coping styles work out in real life? What are the subsequent job satisfactions -- if they are lucky enough to find employment -- of the students using these different styles? Such questions are beyond the scope of the present investigation but certainly point the way for further work, including longitudinal studies.

Another problem arising out of this work concerns the implications for career education. This study at least confirms that vocational maturity -- crystallising and exploring -- is not an autonomous activity, but is intimately related not only to students' ability and locus of control (at least) but also to their motivation for schooling and to the learning strategies they have developed congruent to those motivations. It would seem rather important for career educators to take this inter-relationship into account.

Acknowledgements

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References

Biggs, J.B. Individual and group differences in study processes. British Journal of Educational Psychology, 1978, 48, 266-279.

Broom, L., Duncan-Jones, P., Lancaster-Jones, F. and McDonnell, P. Investigating Social Mobility. Canberra, ANU Department of Sociology (Departmental Monograph No.1), 1977.

Crites, J.O. Career Maturity Inventory, Theory and Research Handbook. Monterey, Calif: CTB/McGraw-Hill, 1973.

De Charms, R. Personal Causation: The internal affective determination of behavior. New York: Academic Press, 1968.

Herr, E.L. Career Development Concepts and Practices: Some International Perspectives. Counselling and Human Development, 11, No.1, 1978

Kerlinger, F.N. and Pedhazur, E.J. Multiple Regression in Behavioral Research. New York: Holt, Rinehart and Winston, 1973.

Lokan, J.J. and Boss, M.W. Locus of Control in Relation to Indices of Vocational Maturity During Adolescence. Paper presented at Annual Conference of American Educational Research Association, New York, 1977.

Mischel, W. Toward a cognitive social learning reconceptualization of personality. Psychological Review, 1973, 80, 252-283.

Phares, C.J. Differential utilization of information as a function of internal-external control. Journal of Personality, 1968, 36, 649-660.

Ross, K.N. Prediction and correlation. Unpublished paper, Melbourne: ACER, 1980.

Rotter, J.B., Chance, J.E. and Phares, E.J. Applications of a Social Learning Theory of Personality. New York: Holt, Rinehart and Winston, 1972.

Super, D.E. Career Development: Self-Concept Theory. Princeton, N.J.: College Entrance Examination Board, 1963.

Super, D.E. Vocational Development Theory: Persons, Positions and Processes. Counselling Psychologist, 1969, 1, 2-9.

Super, D.E., Forrest, D.J., Jordaan, J.P., Lindeman, R.H., Myers, R.A., Thompson, A.S. Career Development Inventory. New York; Teachers College, Columbia University, 1979.

Thorndike, R.L. Reading Comprehension Education in Fifteen Countries: An Empirical Study. Stockholm: International Association for the Evaluation of Educational Achievement, 1973.

Weiss, D.J. Canonical Correlation Analysis in Counselling Psychology Research. Journal of Counselling Psychology, 1972, 19, 241-252.

PAYES: A PROGRAM FOR ASSESSING PRE-EMPLOYMENT SKILLS IN DISADVANTAGED ADOLESCENTS

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Introduction

In many parts of the world the problems of youth unemployment and the failure of traditional school systems to provide suitable education for a large proportion of the adolescent population have become major concerns. The problems are particulary severe for students who, in terms of current societal values, are disadvantaged in that they have low literacy skills and little or no interest in pursuing academic studies.

In recent years progress has been made in the development of education programs catering for the needs of such students. In Australia pre-vocational programs have been set up in schools and, to a greater extent, in TAFE colleges, and pre-employment programs such as EPUY have been established for young people who have already left school. With the expansion of these programs there is a concomitant need for appropriate assessment procedures to be developed. Traditional means of assessment are generally inadequate in that they cater for neither the student clientele nor many of the major objectives of such programs. The Program for Assessing Youth Employment Skills (PAYES) battery is an attempt to fill a need in this area.

Researchers at the Educational Testing Service, headed by Norman Freeberg, began work in 1967 on the materials that have now become the PAYES battery. This work arose in response to a request for measures that could meet the client assessment needs of guidance counsellors working with disadvantaged youth in manpower training programs.

Specifications for an experimental battery were made after areas associated with performance in entry-level jobs in which it was desired to assess basic competency levels were identified. The areas of assessment were determined from a survey of work training program objectives, curriculum materials and learning activities as well as measurement needs perceived by course instructors and guidance counsellors. In developing the battery Freeberg (1969) considered the limitations of existing formal measures, which were:

1 Their formats were entirely verbal at a relatively high reading level with little attempt to stimulate interest. Lower reading level measures were not appropriate as they usually contained material for younger children which adolescents and younger adults would consider to be demeaning or childish.

2 Content often dealt primarily with middle-class and majority concepts, language or experience, thus making it culturally biased.

3 The relatively lengthy presentation of most formal measures added to easy distractibility and poor test-taking motivation often attributed to disadvantaged adolescents.

4 Performance of disadvantaged adolescents on intellectual ability tests has been found to be superior where oral presentation is used.

5 The large group highly-structured administration procedures for most pencil and paper tests make the examiner more removed from the respondents, thereby minimizing the opportunity for enhancing motivation or reacting to the respondents' difficulties.

6 Tight time restrictions are especially detrimental to non-competitive individuals who are not 'test-wise'.

7 Other general administrative deficiencies, such as the requirement of transposing answers on to a separate answer sheet or the arrangement of large numbers of items in such a way that sequence can be confused and items missed, can have negative effects on disadvantaged students' performance.

Thus the rationale for the PAYES measures, on the whole, is practical rather than theoretical. The assumption was made that competency in certain very basic job-related skills and attitudes is a pre-requisite for satisfaction and successful performance in entry-level jobs as well as success in actually obtaining jobs. The PAYES materials include measures of job-related attitudes and cognitive skills, but do not include measures of general ability, or of basic reading or numerical skills, or of other types of abilities common in differential guidance batteries which have their roots in differential psychology. The one exception in the PAYES battery is the interest measure.

The PAYES materials are presented in a format which attempts to overcome the limitations listed above. The measures are relatively short, are designed for oral presentation, contain pictorial information to supplement the verbal, use a level and style of language appropriate to adolescents or young adults of low verbal skill, present only a few items to a page, and allow for the marking of item responses directly in the test booklets. The administration is untimed, and the recommended procedures allow for the maximum possible level of respondent understanding of the tasks required. A precise grade level for the verbal content could not be established because the material is also presented orally; however, using the Thorndike-Lorge Word List Freeberg has estimated the reading level to be about American fifth-grade.

Where pictorial information is included, there is a scene portraying a youthful adolescent figure in a situation relevant to the particular intention of the measure. To make the items applicable to a number of ethnic and racial groups, simple line drawings in a cartoon style similar to those used in the Rosenzweig Picture Frustration Test (Rosenzweig, 1960) were used in the experimental battery to neutralize features that might otherwise depict race. In the early versions of PAYES there were separate male and female forms of the measures that featured drawings. In the published version, which otherwise consists entirely of items taken from the original battery, the items portray 'neutral' or 'unisex' figures rather than the male or female figures of the earlier versions. This change is consistent with current concerns to avoid sex stereotyping and sex bias in educational materials. With the change from two-sex to unisex drawings some changes in verbal content were also necessary.

From the time of their initial development the PAYES measures have been subjected to extensive trial and validation, resulting in some modifications to the original battery. The worth of the original tests, however, is revealed in the fact that the modifications necessary have been minor rather than major.

Methodology

Instruments

The American PAYES instruments were adapted for Australian conditions by a team of researchers, teachers and counsellors. The eight measures in the PAYES battery are divided into three categories:

1 Attitudinal Measures.

a Job-Holding Skills - which measures perceptions of appropriate employee behavior in a job setting.

b Attitude toward Supervision - which measures the degree of compliance with requirements imposed by authority figures in a variety of interpersonal situations.

c Self Confidence - which measures feelings of self-worth and expectations for acceptance or

achievement in a variety of social, vocational and educational settings.

d Orientation toward the Future - which measures the degree of acceptance of responsibility for one's own future together with the ability to defer gratification.

2 Cognitive Measures

a Job Knowledge - which measures knowledge of basic aspects of a range of conventional jobs.

b Job-Seeking Skills - which measures knowledge of basic ways of looking for and applying for jobs.

c Practical Reasoning - which measures the ability to follow directions in two hypothetical job settings.

3 Vocational Interest Measure

-the Vocational Interest Inventory, which measures degree of interest in eight major occupational areas: Aesthetic, Business, Clerical, Outdoor, Scientific, Service: Caring, Service Industries and Technical

The Australian PAYES instruments are brief and attractively presented with clear line drawings accompanying many of the items. Numbers of items per test range from 11 to 28, apart from the interest inventory which contains 45 items. The number of items per page is usually three, and students select their answers from three, four or five alternatives. Careful attention must be given to details of administration because persons with low verbal skills may have negative feelings toward multiple choice pencil-and-paper tests. The measures are designed for untimed, oral administration to small groups to help create an informal, relaxed atmosphere unlike the traditional testing atmosphere. Students mark responses directly on the test booklets and may ask questions about many aspects of the material during the test session.

PAYES is intended primarily as a guidance tool, and is thus likely to be of most benefit if administered to students at the beginning of a program. Hence it is important that results on the measures should be immediately available to program co-ordinators, instructors and counsellors. With these factors in mind, PAYES was designed for local scoring so that students' needs with respect to the content covered in the measures can be identified as quickly as possible. A Profile Booklet for each student containing scoring grids and a detachable profile chart is provided with the materials. The profile chart allows for visual comparison of an individual's performance on each of the cognitive and attitudinal measures with a specified minimum competency standard. (The determination of the standards is discussed later in the paper).

Data Sources

The Australian PAYES trials were carried out during the first half of 1979, when adapted instruments were given to two groups of students. In the first group were about 900 students enrolled in the Federal Government's Education Program for Unemployed Youth (EPUY) in New South Wales, Victoria, Queensland and South Australia. The other group comprised about 700 students in Years 9 and 10 in a selection of secondary schools in Melbourne and surrounding areas. For selection of schools, members of the Counselling, Guidance and Clinical Services of the Education Department were asked to suggest schools where the dropout rate at Year 10 would be higher than average and, as far as possible, in different parts of Melbourne. From the list of suggested schools, five high and two technical schools were chosen to participate in the trials. In schools where streaming occurred in English or Mathematics only the lower streams were tested. In schools where no streaming occurred . all students were tested, but only the papers of those students scoring in the lower two thirds on a Word Knowledge test administered with the

PAYES measures were used.

The EPUY is directed towards school leavers having difficulty in retaining or obtaining employment. The clients are young people - the majority under 21 - for whom low or inadequate qualifications form the main barrier against obtaining stable employment. The EPUY sample involved in the PAYES trial was almost a population in the four states concerned as all participants present in 72 of the 74 centres on the days selected for testing were included. After allowing for absentees and incomplete test papers, data were collected for between 850 and 990 participants, depending on the test. The average age of the EPUY students was 18½ years with slightly more females than males in the group.

'Literacy' and 'numeracy' scores were also collected for EPUY students as were achievement results for students in two of the schools.

Administration

It was possible to administer only four of the PAYES measures to the EPUY group - Job Knowledge, Job-Seeking Skills, Map Reading (part of Practical Reasoning) and the Vocational Interest Inventory. These measures were administered in the first or second week of the program and again as post-tests. The interval between pre- and post-testing in some programs was very short and in many programs the numbers of students remaining for the post-tests were greatly reduced, therefore only pretest data have been considered for the PAYES trials.

In the school group all the PAYES measures and a Word Knowledge test measuring verbal ability (Thorndike, 1973) were used. Although no time limits were set, it was realized that it would not be possible for all students to complete all tests because of timetable restrictions. The order of the last four tests was therefore randomized for the different groups to ensure that adequate numbers of students completed each of the tests.

Analyses

Analyses carried out included standard item analyses, factor analyses of the Interest Inventory at the item level and missing data correlation analyses of the PAYES subtests and various criterion variables. Separate analyses were carried out for the EPUY and school groups. A committee of counsellors, educators and employers met to establish minimum competency standards for the attitudinal and cognitive tests.

The item analyses for the EPUY group were based on the responses of a 1 in 4 sample of those completing each test (N≑ 250 in each case). As discussed previously, those students in the school group scoring in the top third of the distribution on the Word Knowledge test were eliminated from the analyses. Since only about 250 students in each group were required for the item analyses, these analyses for the school group were conducted using the responses of the lower two-thirds of students from only four of the schools. The Interest Inventory factor analyses and correlation analyses were carried out on data from the whole EPUY sample and from those students in all seven schools who scored in the lower two-thirds on the Word Knowledge test.

Results and Discussion

Setting of Standards

The suggested standards were set according to the judgmental method described by Angoff (1971). A review panel consisting of three employers, four counsellors or program co-ordinators from TAFE centres,

a psychologist working with unemployed persons, and two teachers from correctional institutions, was constituted. All panel members had experience in teaching, counselling or supervising adolescents and young adults with low verbal skills.

The panel first discussed the concept of 'minimum competency' - the minimum level of functioning that would be considered acceptable in a person applying for an entry-level job - with respect to the knowledge and attitude areas respresented in PAYES. Panel members then made individual judgments (written) about the probability of a minimally competent person's correctly answering each of the items in the cognitive measures. For the attitudinal measures judgments were made about the probability of a minimally competent student's choosing each option. The probability estimates were then pooled and averaged for each measure. In calculating the averages, the judgments of the employers, who were under-represented on the committee, were given greater weight. The averaged results were then checked against the trial data and the suggested 'minimum competency' standards were set.

The cut-off scores defining minimum competency resulted in percentages between 27 and 74 in the 'competent' score range, depending on the test. The equivalent range of percentages in the US trials was 17 to 66 (but not on the same tests). Further discussion of the standards-setting procedures and results can be found in the PAYES Manual (ACER, in press), which also contains a section on counselling implications of the various score ranges.

Means and Standard Deviations

No significant differences were found between the Australian EPUY and school groups on any of the cognitive subtests. Due to changes in test content, the only valid comparison that could be made with the US group on the cognitive subtests was for Job-Seeking Skills, for which both Australian groups scored higher than the American group. As the EPUY group did not do the attitude subtests, comparisons could only be made between the Australian school group and the US group. For Attitude toward Supervision there was no significant difference between these two groups. The Job-Holding Skills and Self Confidence comparisons, however, revealed differences in favour of the American group.

As the Australian Interest Inventory had been expanded, comparisons with the US sample were not possible. Several significant differences did occur between the two Australian groups, with the EPUY group scoring consistently higher on all but the Clerical, Scientific and Aesthetic scales, where the differences were not significant. The difference in average age between the two groups - about three years - could perhaps account for these differences, as interests tend to become more crystallized with increasing age.

On two of the attitude measures (Job-Holding Skills and, to a lesser extent, Self Confidence) and all of the cognitive measures, the mean scores reflect some degree of a 'ceiling effect'. Students or trainees indicated a tendency to score considerably closer to the maximum possible score on the measure than to the minimum possible score. For the Australian groups the median score was less than one score point from the mean in each case, indicating that the distributions were symmetrical rather than skewed; however, they were symmetrical about values considerably to the right of the mid-points between minimum and maximum possible scores. In other words the tests contain several items that the students found very easy, so that few students obtained very low scores.

The tendency for students to score high on measures such as PAYES should be regarded as a positive rather than a negative effect. The types of students for whom PAYES is designed are likely to have negative

feelings about paper-and-pencil tasks and to have experienced failure on many conventional school tests; hence it is desirable that PAYES should contain a higher than usual proportion of easy items. PAYES measures are also designed as 'mastery' tests, for which the students' scores are to be compared against pre-specified standards. A ceiling effect, unless extreme, does not dilute the value of the measures as guidance tools because their primary purpose is to help identify students or trainees who score below minimum competency levels and who therefore require extra assistance even though they may constitute a small proportion of this group. The existence of ceiling effects does lessen the potential usefulness of some of the measures for program evaluation purposes. It is possible to compare percentages achieving mastery at the beginning and end of training, but actual changes occurring are more likely to be underestimated in measures with pronounced ceiling effects.

Standard Errors of Measurement and Reliability

The reliability indices ranged from 0.57 for the 11-item Job-Holding Skills measure in the school group to 0.86 for the 7 items of the Technical Interest scale in the EPUY group. In the main, these are not only adequate for the primary measurement purpose to which PAYES is suited (i.e. as a guidance tool), but are also of respectable magnitudes for measures constrained by design requirements to such relatively short lengths. The cognitive-skill measures, which are somewhat longer than the attitudinal ones, tend to be higher in reliability and to possess proportionally smaller standard errors of measurement. The reliabilities of the Vocational Interest scales were also found to be at substantial levels for short scales, ranging from 0.59 to 0.86, with all but the values for the Aesthetic scale reaching 0.70.

Item Difficulties and Discriminating Power

The average difficulty levels of items in each cognitive measure and some data on item discrimination indices in each of the attitudinal and cognitive subtests are presented in Table 1. The average percentage

Table 1: Item Discrimination[a] Results and Average Item Difficulties for EPUY[b] and School[c] Groups, Cognitive and Attitudinal Measures

Measure	No. of Items	Discrimination indices: Average	Highest	Lowest	No. not Sigf. diff. from 0	Average % correct
EPUY Group: (i) Cognitive Measures						
Job Knowledge	28	34	52	07	2	85
Job-Seeking Skills	17	39	54	21	0	78
[Map Reading][d]	9	39	60	23	0	70
School Group: (i) Cognitive Measures						
Job Knowledge	28	25	43	05	2	85
Job-Seeking Skills	17	29	47	06	2	77
Practical Reasoning	17	28	45	15	0	70
[Map Reading][d]	9	32	56	18	0	75
School Group: (ii) Attitudinal Measures						
Job-Holding Skills	11	25	39	10	1	n.a.[e]
Attitude toward Supervision:						
Total	13	29	51	0	3	n.a.
Positive items	4	35	47	20	0	n.a.
Negative items	9	51	60	42	0	n.a.
Self Confidence	15	21	34	05	2	n.a.
Orientation toward the Future	13	31	47	16	0	n.a.

a Item-remainder correlation coefficients, decimal points omitted.
b Based on a 25 per cent random sample of the total group (N ≐ 250).
c Based on the lower two-thirds of students from four schools (N ≐ 250).
d Part of Practical Reasoning measure.
e Not applicable

correct per item ranged from 70% (Practical Reasoning, school group and Map Reading, EPU group) to 85% (Job Knowledge, both groups). The relative easiness of the tests has a limiting effect on the discriminating power of the items. The discrimination indices are however generally satisfactory for tests designed as 'mastery' measures. The discrimination indices for the Interest items grouped into the eight scales derived by factor analysis were rarely lower than 0.40. These higher levels were reached because of the relatively homogeneous nature of the scales and generally wider ranges of scores obtained.

Indices of Validity

Relationships among the PAYES Measures. As an indication of the structure of the total PAYES battery, excluding the Interest scales, intercorrelations between the attitudinal and cognitive subtests for the Australian school group are presented in Table 2. Each coefficient was computed on all pairs of valid observations; since the numbers of students with data varied from test to test, being especially low for the Practical Reasoning measure, the correlations are not strictly comparable. As the complete Practical Reasoning test was given only if time permitted, the data for this measure mostly pertain to the relatively more able students. Some attenuation of the correlation coefficients could therefore have occurred because of range restriction. The correlations obtained between the various measures in the 1978 American field trial are also included in Table 2.

Table 2: Intercorrelations[a] among PAYES Attitudinal and Cognitive Measures, Australian School Group and Combined 1978 American Sample[b]

	1	2	3	4	5	6	7
Measure	Job-Holding Skills	Attitude toward Supervision	Self Confidence	Orientation toward Wkdgn	Job Knowledge	Job-Seeking Skills	Practical Reasoning[c]
1	-	26	08	21	27	21	10
2	*28*	-	16	36	19	27	28
3	*33*	*20*	-	12	17	11	11
4	*n.a.*[d]	*n.a.*	*n.a.*	-	32	28	28
5	*30*	*22*	*21*	*n.a.*	-	52	37
6	*22*	*22*	*19*	*n.a.*	*58*	-	54
7	*16*	*21*	*15*	*n.a.*	*64*	*61*	-

a Decimal points omitted.
b Australian results above diagonal (regular type), American results below diagonal (italics).
c Australian version considerably modified from American one.
d Not applicable.

The patterns of intercorrelations show a distinct cognitive cluster in the American data represented by the Job Knowledge, Job-Seeking Skills and Practical Reasoning measures; a cluster which was quite well supported by the Australian results. The measures of Job-Holding Skills, Attitude toward Supervision and Self Confidence formed a second, although weaker, cluster for both the American and Australian groups, a cluster which appears to be attitudinal rather than cognitive in nature. The intercorrelations obtained for the 'Orientation toward the Future' scale, supposedly an affective measure, paired with the cognitive variables were slightly higher than those among variables in the attitudinal cluster, though on average substantially lower than those among variables in the cognitive cluster. Perhaps the concepts presented in this measure require a higher level of cognitive functioning on the part of students in reacting to them than do the concepts in the other attitudinal measures.

The intercorrelations between the Interest scales and the other PAYES measures were generally not significantly different from zero. Of 56 possible intercorrelations involving Interest scales paired with other measures for the school group, only eight were significantly different from zero at the .01 level, and only one exceeded 0.20 in magnitude. Three of the significant correlations involved degree of interest in service industries, which was negatively related to scores on the three cogntive measures. A similiar result occurred for the EPUY group, where two of the only three significant correlations among 24 possible results for interest scales paired with other subtests involved the Job-Seeking and Job Knowledge measures which were negatively related to degree of interest in service industry tasks. Scores on three of the Interest scales - Clerical, Scientific and Aesthetic - were positively correlated with Self Confidence scores in the school group.

Relationships with Other Variables. Only limited data useful in assessing the validity of the Australian PAYES measures has so far been collected. In both the EPUY and school groups the data have been concurrent rather than predictive. Unfortunately it was not possible to collect any rating data or performance measure at the end of the EPUY program which could be used as criteria of success for purposes of assessing the predictive validity of the PAYES measures given near the beginning of the program. Achievement data were collected in two of the schools based on mid-year assessments and examinations, but as these took place within a month of the PAYES administration the data have been regarded as concurrent rather than predictive. The EPUY group were given locally developed tests of basic literacy and numeracy (Bourke and Lewis, 1976) during the same week as they completed the PAYES cognitive measures. The concurrent validity indices for the EPUY group are shown in Table 3, while those for the school group are presented in Table 4.

Table 3: Concurrent Validity Indices[a] for PAYES Cognitive Measures, EPUY Group[b]

PAYES measure	Basic Reading	Basic Numeracy
Job Knowledge	0.46	0.48
Job-Seeking Skills	0.53	0.57
Map Reading	0.39	0.57

a Pearson product-moment correlation coefficients.
b Total group, N ranging from about 850 to about 950.

Table 4: Concurrent Validity Indices[a] for PAYES Attitudinal and Cognitive Measures, School Group[b]

PAYES Measure	Other Measure	Word Knowledge (N = 433)	English Achievement (N = 131)	Mathematics Achievement (N = 131)	Total Credits to Year 10 (N = 68)
Job-Holding Skills		0.14**	0.08	-0.07	0.02
Attitude toward Supervision		0.19**	0.22*	0.10	0.27*
Self-Confidence		0.11*	0.04	0.00	-0.06
Orientation toward the Future		0.35**	0.20*	0.10	0.12
Job Knowledge		0.32**	0.31**	0.35**	0.38**
Job-Seeking Skills		0.33**	0.34**	0.29**	0.40**
Practical Reasoning		0.44**	0.15	0.29*	0.42*
[Map Reading]		0.33**	0.32**	0.37**	0.32**

a Pearson product-moment correlation coefficients.
b Based on lower two-thirds of distribution on Word Knowledge scores; note that, within this group, all coefficients were computed for non-missing data pairs, hence the numbers on which the coefficients are based vary (the Ns above the columns are the numbers with data on the criterion variables alone).
* and ** Correlations significantly different from zero at .05 and .01 levels, respectively.

On the whole the concurrent validity indices obtained in both the Australian trial groups confirm the existence of measures of two types of factors in the PAYES battery (excluding the Interest scales). In the EPUY group moderately high correlations, ranging from 0.46 to 0.57, were obtained in all but one instance ($r = 0.39$) between the cognitive PAYES measures and tests of basic literacy and numeracy skills. In the school group all the PAYES measures were significantly correlated with Word Knowledge but, apart from the measure of future orientation, correlations with Word Knowledge involving attitude measures were considerably lower than those involving cognitive measures. The possibility that the 'future orientation' measure contains concepts requiring a higher level of verbal functioning to respond to than the other attitude measures was discussed in the previous section. Among the remaining criterion variables - English, Mathematics and overall achievement data collected in two schools only - significant correlations with the PAYES cognitive measures were found in all but one instance (Practical Reasoning with English achievement), and non-significant correlations were found in nine of twelve combinations of achievement and PAYES attitudinal variables.

American Trials

The collection of data for the purpose of validating PAYES has been much more extensive in the United States. The first version of the instruments, known as the Enrollee Test Battery (ETB), appeared in 1967. The ETB, which contained thirteen measures, was used in a number of studies involving trainees from programs such as the Neighborhood Youth Corps (NYC) and those conducted by the Opportunities Industrialization Centers of America (OICs).

Criterion measures in the earliest studies were ratings of trainee performance during the program, assigned by counsellors and work-site supervisors. An extensive study focussing on the development of appropriate criterion measures was then carried out (Freeberg, 1976). In subsequent studies the ETB was administered to more than 300 trainees in each of NYC and OIC programs, and to about 50 youths in detention centers. In all three studies program-completion criterion data on about forty variables were collected. In the NYC and detention-centre samples follow-up measures of about thirty variables were collected, six months later for the NYC group and six months to a year after release for the detention-centre group. The program-completion criteria consisted of proficiency ratings, overall program adjustment, social and family adjustments, vocational plans and work motivations. The follow-up criteria included job-search strategies, vocational planning, family and social adjustments, and, for those who had obtained a job, job competence, adjustment and satisfaction.

Among the measures showing consistent significant levels of validity, the results indicated generally higher levels for two of the three Practical Reasoning tests in the battery at the time, followed by the measures of Job Knowledge, Job-Holding Skills and Job-Seeking Skills. Lower, though still significant, levels of validity were found for the measures of Self-Esteem (now called Self Confidence) and Attitude toward Authority. Several measures for which predictive validity was negligible or inconsistent were dropped from the battery at this stage; these included measures of motivation and aspiration and one of the three Practical Reasoning measures, File Card Sorting, which was too easy.

The measures remaining were then renamed the 'PAYES' measures and were administered in extensive field trials during 1978. About 1350 enrollees in vocational education special-needs classes, skills-

training centres and correctional institutions were involved in the trials. Criterion data collected were ratings of attitudes and performance during the program assigned by counsellors, vocational skills instructors and work-site supervisors. The relative ranking of overall validity for the various measures in the 1978 field trials was almost the same as the results obtained in the earlier studies, but the magnitude of the correlation coefficients tended to be lower. This finding was attributed to the widely diverse nature of the programs sampled in the 1978 trials. Further American studies are expected to result in better levels of validity through concentrating on school and skills-training programs with more similar goals, operational characteristics and content of training curricula (Freeberg and Vitella, 1979).

The Future of PAYES in Australia

The validity of the experimental Enrollee Test Battery (ETB) in the United States has been demonstrated with reference to a wide variety of criteria, and the validity of the PAYES battery which evolved from the ETB has been demonstrated to a limited extent in both Australia and the United States. There remains in both countries, but particularly in Australia where no study of a preliminary battery took place, a need to demonstrate the predictive validity of the PAYES measures in relation to a wider range of criteria than the proficiency ratings and achievement measures used in the field trials. For this reason the Australian version of PAYES is being released as an 'Experimental Edition'. It is hoped that data from further studies will be able to be supplemented by data accumulated by users in the improvement of validity evidence for PAYES in Australia.

There is an obvious need for psychometrically sound instruments for use in assisting disadvantaged adolescents in Australia, as elsewhere, to be better prepared for employment. PAYES helps to fill the gap in availability of counselling aids for a relatively neglected section of the adolescent population.

REFERENCES

Angoff, W. Scales, norms and equivalent scores. In R.L. Thorndike (Ed.), Educational Measurement (Second Edition). Washington, DC: American Council on Education, 1971.

Bourke, S.F. and Lewis, R. Australian Studies in School Performance, Vol. II, Literacy and Numeracy in Australian Schools: Item Report. Canberra: Australian Government Publishing Service, 1976.

Freeberg, N.E. Assessment of disadvantaged adolescents: a different approach to research and evaluation measures. Research Bulletin 69-41, Princeton, NJ: Educational Testing Service, 1969. An abbreviated version of this report appeared in the Journal of Educational Psychology, 1970, 61, 229-240.

Freeberg, N.E. Criterion Measures for Youth-Work Training Programs: The Development of Relevant Performance Dimensions. Journal of Applied Psychology, 1976, 61, 537-545.

Freeberg, N.E. and Vitella, P.E. PAYES Technical Manual. Princeton, NJ: Educational Testing Service, and New York: Cambridge, 1979.

Rosenzweig, S. The Rosenzweig Picture-Frustration Study, Children's Form. In A.I. Robin and M. Haworth (Eds), Projective Techniques with Children. New York: Grune and Stratton, 1960.

Thorndike, R.L. Reading Comprehension Education in Fifteen Countries: an Empirical Study. Stockholm: International Association for the Evaluation of Educational Achievement, 1973.